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Appendix J
Dredge Test Area Contaminant Characterization Pre-Design Field Test
Dredge Technology Evaluation Report

APPENDIX J

Dredge Test Area Contaminant Characterization Pre-Design Field Test
Dredge Technology Evaluation Report
New Bedford Harbor Superfund Site

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J.1 INTRODUCTION

The Pre-Design Field Test (PDFT) was undertaken to evaluate the performance of a dredge system being considered for use at the New Bedford Harbor Superfund Site. The objectives of the Pre-Design Field Test included: 1) evaluating actual dredge performance relative to removal of contaminated sediments; 2) evaluating the dredge's ability to minimize environmental impact to water quality by measuring the extent of contaminated sediment resuspension; and 3) evaluating the dredge's ability to operate within acceptable air quality levels. The technology selected for the study was a hydraulic excavator equipped with a slurry-processing unit (provided and operated by Bean Environmental LLC).

The evaluation of the dredge performance relative to removal of contaminated sediments included two components: 1) The first (primary) goal was to evaluate the dredge's ability to remove contaminated sediments <u>to a given depth horizon</u> relative to the dredging plan (Foster Wheeler Environmental Corporation – FWENC, 2000a). Results of this analysis are reported within Section 3 of the main report; and 2) A secondary objective was to determine how effectively the dredging technology could remove contaminated sediments within the test area by comparing pre and post dredge PCB concentrations. This information was used to determine overall PCB mass removal efficiency and to evaluate the effectiveness of this technology with regard to site-specific cleanup levels under the conditions of the PDFT. Results of this evaluation are reported in this Appendix.

The PDFT was performed in August 2000 in a 100-foot by 550-foot (31m x 168m) area within New Bedford's Upper Harbor (Figure J-1) referred to in this Appendix as the "test area". Prior to dredging, a series of sediment cores were collected in this area. Cores were split into 1-foot (0.3m) sections to undergo PCB analysis. Geostatistical methods were used to map the initial PCB concentration in sediments in 1-foot (0.3m) horizons over the test area. Following dredging, sediment cores were collected in the test area at the same locations as the cores taken before dredging and analyzed for PCBs. The results were then mapped over the test area. Comparison of the pre- and post-dredging PCB data allowed for assessment of the PCB removal efficiency of the dredging system during the PDFT.

Characterization of surface sediments within the test area prior to dredging indicated a high silt-clay content and a high water content (32-43% solids by weight). Therefore, it was envisioned suspension of material during dredging and sloughing of the sediment adjacent to the dredged area could re-contaminate the test area (especially along the boundaries) either during or shortly after dredging was completed in a specific area. To evaluate the extent of this potential re-contamination, post-dredging surface grab samples were collected at each core location, as well as at a series of other locations within the test area.

This Appendix reports on the comparison of the pre- and post-dredge PCB concentrations as part of the overall efficiency evaluation. The work represents a joint effort by the U.S. EPA (Region I and ORD), the U.S. Army Corps of Engineers (USACE, New England District), and ENSR International (under contract DACW 33-96-D-004 to the USACE). The results of the water quality monitoring and air quality monitoring can be found in Appendices K and L, respectively.

J.2 METHODS

J.2.1 Selection of Sampling Locations

A systematic grid of 30 sampling points was assigned to the original 100-foot by 400-foot (31m x 122m) dredging test area (cuts 1-14 in Figure J-2). These sampling points are labeled as EPA 1 through EPA 30 in Figure J-2. Spacing of the sampling points was designed to allow for adequate characterization of the pre-dredge PCB concentrations within the test area to assist in development of the dredge plan. The spacing and number of sampling points also allowed for performance of statistically valid comparisons between pre- and post- dredging concentrations to assess the ability of the dredge to achieve target cleanup levels within the test area.

Prior to the start of the dredging, the original test area was expanded 150 feet (46 m) to the west into the adjacent deeper water (cuts A-E in Figure J-2) to permit more dredge volume should it have been needed over the course of the PDFT. Consequently, the existing sampling grid was expanded into this area, with an additional 10 sampling points established and sampled prior to the start of dredging. Post-dredge samples were collected at the same locations as the pre-dredge samples with the addition of sampling point EPA 31. This sample point was added to allow for characterization of post-dredge sediment conditions in the portion of cut A of the provisional area that was ultimately dredged (Figure J-2). Target and actual sampling locations are presented in Table J-1.

Additional post-dredge grab samples were collected at other locations within the test area. These grabs were taken with the goal of assessing surficial sediment contaminant levels within the first 0-2 cm (0-0.8 inches) immediately after dredging. The specific target locations for these grabs were not determined prior to sampling. Rather, the general area and spacing were established, with the actual locations determined as the sampling crew worked around the shifting dredge-anchor system. The grab sampling included locations near the center of each dredge cut as well as closely spaced locations along two transects crossing cut 1. Transects were located in Cut 1 to assess potential worst case conditions for recontamination of the dredge area due to sloughing. Cut 1 was chosen for this assessment because it was bordered on three sides by undredged areas containing thick layers of contaminated silt. Actual sampling locations are presented in Figure J-2 and in Table J-1.

J.2.2 Pre-Dredge Sediment Collection

Sediment core samples were collected at 40 stations including the 30 samples from the original 100-foot x 400-foot (31m x 122m) dredge footprint of the test area and the 10 additional samples from the expanded test area located immediately to the west (Figure J-2). Samples were collected using 2.625-inch (6.668cm) outside diameter push-core barrels (clear polycarbonate liners) that were outfitted with an internal piston for maximizing recovery and for maintaining the stratigraphy within the core samples. The sampling platform used for the effort was a 26-foot Carolina Skiff. The vessel was equipped with a center moon-pool well and A-frame for deploying and recovering sampling equipment and a 3-point anchoring system for accurate vessel positioning. Coring operations were performed by TG&B, Inc.

Sampling was accomplished by mounting a bearing plate and extension pole atop a length of polycarbonate liner. The piston was positioned inside at the bottom of the liner, and an attached cable was led up inside the liner and out through the top of the bearing plate. At each station the depth was accurately recorded and transferred to the rigging of the sampling equipment along with a second mark with a differential of +4 feet (1.2 m) in order to indicate the target penetration depth required by the project. Once the bottom of the core barrel reached the sediment water interface, as indicated by the markings, the cable leading down to the top of the piston was secured to a fixed point on the A-frame, thus preventing any further vertical movement downward with the core barrel. The core barrel was manually driven into the sediments. The piston, fixed at the sediment/water interface, placed the sample under negative pressure during retrieval, allowing for recovery of a nearly undisturbed core sample.

The core barrel was driven through the soft materials until the target 4-foot (1.2m) penetration was achieved. At some locations, the core barrel could not be manually driven the full 4 feet (1.2m). Smaller penetration depths (less than 4 feet (1.2m)) were permitted if, upon core retrieval, a visible horizon marking the transition between the soft black surficial material and underlying lighter colored clay was obtained. For the cores collected in the expanded test area, longer cores (greater than 4 feet (1.2m)) were collected to ensure that the soft black surficial material was fully penetrated.

A firm sandy bottom was encountered at stations 6 and 18, which significantly limited the depth the cores could be driven to manually. For these stations, the outside of the liner was armored with a steel jacket and a vibratory attachment was used to achieve a greater penetration depth. Once the sampling equipment was recovered, the core barrel was removed from the assembly and immediately capped on the bottom and promptly labeled. Any overlying water was allowed to settle, and the liner was cut just above the sediment/water interface and securely capped.

Additional information on sampling methodology can be found in the Quality Assurance Project Plan (QAPP) and related coring Standard Operating Procedures (ENSR, 2000).

J.2.3 Post-Dredge Sediment Collection

Post-dredge core sampling methodology was similar to that of the pre-dredge effort. However, all cores were collected using a push-core (no vibracore) since the required depth of penetration was only 2 feet (0.6m) below the sediment water interface, as opposed to the 4 feet (1.2m) in the pre-dredge effort. The post-dredge coring targeted only those sampling points that fell within the area actually dredged during the PDFT (see Figure J-2).

In addition to the collection of core samples, grab samples were also obtained at these stations as well as at a number of additional locations to monitor dredge performance (Figure J-2). Grabs were collected along two transects across cut 1 to help characterize a "worst case" of edge effects on recontamination (the cut was bounded by a relatively thick layer of fine-grained surficial sediments). Grab samples were collected using a petite-ponar sampler or a similar device having a penetration depth of approximately 6 inches (0.15m). As the goal of the grab sampling was to assess surficial contamination only, the top 2 cm (0.8 inches) of material was removed from each grab and transferred into a pre-labeled glass jars for laboratory analysis.

J.2.4 Positioning

Positioning for coring was achieved using a survey grade differential global positioning system (DGPS), a Trimble Real Time Kinematic (RTK) system with the capabilities of continuous centimeter level accuracy. Navigational coordinates for each targeted sampling point were pre-entered into the system as "waypoints" so that the vessel operator could view range and bearing information to each sampling point during vessel positioning. Once the vessel was at a given sampling point, fine level positioning adjustments were made using the 3-point mooring system to achieve the requirements of 2-foot (0.6m) horizontal accuracy. To prevent the possibility of maneuvering operations impacting the bottom sediments, anchors for each line were set well outside of the footprint for the evaluation area and buoyant mooring line was utilized. Positioning during the collection of the additional grab samples (collected shortly after a cut was dredged) was achieved with a Trimble Pro-XRS DGPS unit with sub-meter accuracy.

J.2.5 Laboratory Analysis of Sediment PCB Concentrations

The sediments collected for the dredge efficiency testing were analyzed for the 18 congeners selected by NOAA for the National Status and Trends program and by the EPA EMAP program (hereafter referred to as the NOAA 18). Two laboratories supported ENSR in performing the analysis. Arthur D. Little located in Cambridge, MA was selected as the primary laboratory, and Woods Hole Group located in Raynham, MA participated as the backup/QA laboratory.

Sediments arriving at the analytical laboratory were immediately placed in freezers for storage (-0°C) until further processing. Core samples were later thawed partially to allow removal from core tubes and scraped with a stainless steel spoon to remove the outer centimeter of sediment. This scraping process removed sediment transferred to different depths during the coring process and allowed analysis of the undisturbed central portion of the core. The cores were cut into 1-foot (0.3m) sections and allowed to thaw before mixing to form the composite sample. The preparation methods used to generate these data were selected to match methods used by previous investigators and are detailed in the project Quality Assurance Project Plan (QAPP; ENSR, 2000).

The U.S. EPA's Atlantic Ecology Division's Standard Operating Procedure (SOP), *The Extraction of New Bedford Harbor Sediment Samples for PCBs,* was used for this study with minor modifications as proposed in the QAPP. Freon was omitted from the test protocol and replaced with methylene chloride; heptane was replaced by hexane; and an additional clean-up step, using alumina, was added to the method. Sediments were mixed with methylene chloride and acetone and disrupted using ultrasonication. Extracts were cleaned using alumina, activated copper, and sulfuric acid, and exchanged into hexane for instrumental quantitation.

The compounds dibromo-octafluoro-biphenyl (DBOFB), PCB 103, and PCB 198 were added to all samples as surrogate internal standards (SIS) and carried through the sample preparation and analysis process as a measure of accuracy. The Pre-Design Program sediment data sets were SIS corrected using PCB 103 for consistency with other data from the area (New Bedford Harbor Long Term Monitoring Program). In a few cases the recovery of this compound was suspect, and the data were corrected using PCB 198.

Analysis of the final extracts was accomplished using GC/ECD instrumentation, which provides excellent (ppb) detection limits for the NOAA 18 congeners. The analysis utilized two chromatographic columns with dissimilar phases to allow confirmation of the target compounds.

Estimates of total PCBs as homologue were calculated based on a mathematical relationship among these parameters in New Bedford Harbor sediments determined by Foster Wheeler Environmental Corporation (FWENC, 2001). The following formula was used to calculate total homologues:

<u>PCB Homologue Calculations</u>

$$y = 2.5x$$

where:

y = total PCB concentration as homologues in ppm

x = sum of the concentrations of the NOAA 18 congeners in ppm

The laboratory data were validated by ENSR's QA department. Validation included assessment of the following elements:

- Analytical completeness (agreement with chain-of-custody and project requirements);
- Sample preservation and holding times;
- Instrument initial and continuing calibration information;
- Laboratory method blank/equipment blank contamination;
- Surrogate spike recoveries;
- Matrix spike/matrix spike duplicate (MS/MSD) results;
- Laboratory control sample (LCS) results;
- Standard reference material (SRM) results;
- Instrument reference standard (IRS) results;
- Internal standard performance; and
- Quantitation limits and sample results.

The validation was used to potentially qualify or reject sample or individual congener data that did not meet the data quality objectives established in the QAPP (ENSR, 2000).

J.2.6 Geostatistics and Mass Removal

The composite values for each depth horizon were used to produce PCB concentration contour maps of the PDFT area for three sediment depth horizons in the pre-dredge conditions (0-1 foot, 1-2 foot, 2-3 foot (0-0.3m, 0.3-0.6m, 0.6-0.9m)) and for one depth horizon in the post-dredge conditions (0-1 foot (0-0.3m)). Contours were produced using both inverse distance weighting (IDW) and kriging methods to interpolate the PCB data between core locations.

The PCB mass removed was estimated by first calculating the mean PCB concentration within each 1-foot (0.3m) horizon. This concentration value (mass PCB/mass sediment) was then multiplied by the mass of sediment within each horizon to obtain the total mass of PCBs within each horizon. The PCBs within the three 1-foot (0.3m) horizons were summed to obtain the total PCBs within the test area. A similar process was used to calculate the PCB mass in the top 1-foot (0.3m) of sediment after dredging. The post-dredge mass of PCBs was divided by the pre-dredge mass to obtain the overall PCB removal efficiency.

J.3 DESCRIPTION OF THE COLLECTION EFFORT

Collection of the pre-dredge sediment samples over the original pre-design test area (cuts 1-14 in Figure J-2) was performed on 13-16 June 2000. This allowed for sufficient time to complete the laboratory analyses and to incorporate the results into the dredging plan for the test area. Just prior to the start of the dredging in August 2000, an expanded test area was defined to the west of the original test area (cuts A-E in Figure J-2) to accommodate potential additional dredging during the PDFT. Additional cores were collected in this area immediately prior to the start of dredging (7-8 August 2000). Samples from this expanded test area were archived and were to be analyzed only if dredging was actually performed in that area. A summary of the pre-dredge collection efforts is presented in Table J-2.

Grab samples of the top 0-2 cm (0-0.6 inches) of sediment were collected as soon as practicable after dredging was completed in a given cut, generally on the same day as the dredging and often within several hours of the dredging. These grab samples were collected from 12 August through 18 August. Reoccupation of the pre-dredge sampling points and collection of cores and grabs was performed on 17, 18, and 21 August, all within two to four days of the completion of dredging in a given cut. A summary of the post-dredge collection efforts is presented in Table J-2.

J.4 RESULTS

J.4.1 Analytical Results

The results from the analysis of pre-dredge core samples are presented in Table J-3. Post-dredge core and grab data from the pre-established sampling grid are presented in Table J-4. Analytical data from the additional post-dredge grabs collected along the two transects across cut 1 are presented in Table J-5. A summary of the total PCB concentrations (as total homologues) for all of the analyzed sediment samples is presented in Table J-6. Note that pre-dredge cores from the provisional test area that was not dredged and the additional non-transect grab samples (see Figure J-2) were not analyzed.

Samples or individual congener data that did not meet the data quality objectives (DQO's) established in the QAPP were flagged/qualified. None of ENSR's findings warranted rejection of any data. Selected sample or congener results were qualified with a "J" to indicate that the value was below the statistically derived reporting limit or did not meet project DQO's and should be considered an estimate. Detailed qualifier explanations were included in the associated validation memoranda and summarized on the data tables.

Equipment blank data associated with the core collection effort were determined to be clean relative to the sediment concentrations. Congeners PCB 8, PCB 118, PCB 170, and PCB 195 were not detected in the blank. The remaining congeners were detected at concentrations <1% compared to sample results.

J.4.2 Pre-Dredge Characterization

A physical description of the pre-dredge cores is presented graphically in Figure J-3. The logs in this figure are based on visual observation of the sediment material through the clear polycarbonate core tubes. As the tubes scratch easily and the coring process can potentially drag sediments down, smearing them along the wall of the core tube, the core logs should be considered approximate. For cores that were designated for analysis, the tube was cut away in the lab (the cores had been frozen). The outer layer of sediment (that was potentially smeared during the coring process) was scraped away in the lab exposing the inner sediments. The lab recorded the approximate position of significant color and texture changes for the inner section of the core. This position has been noted in the core logs as the red lines in Figure J-3.

A review of the core logs in Figure J-3 reveals that most of the PDFT area was overlain with a layer of black silty material. The thickness of this layer generally increased from east to west, ranging from several inches in cut 14 to over 4 feet (1.2m) in cut E. This material had a high water content and often had a distinct H_2S and/or petroleum odor. Shell fragments were also observed in this material. Sand was noted beneath the thin layer of silt material in the extreme eastern portion of the area. Over the remainder of the pre-design area, the black surficial deposit was underlain by a light gray, clay-like material.

For the cores that were analyzed, the PCB concentrations (ppm as total homologues) have been overlaid on the core logs in Figure J-4. Each reported value represents the concentration in the 1-foot (0.3m) section of core that was composited for analysis. A review of Figure J-4 reveals that elevated PCB concentrations are generally restricted to the silty surficial deposit. PCB concentrations ranged from several hundred to several thousand ppm for 1-foot (0.3m) composite core sections that consisted entirely of the silty material. The 1-foot (0.3m) composite core sections that were entirely situated in the underlying clay or sand deposit had no or very low (<10 ppm) detectable PCB concentrations.

J.4.3 Post-Dredge Characterization

A physical description of the post-dredge cores is presented graphically in Figure J-5. For the area that was dredged, the sample logs reveal a uniform layer of light gray, clay-like material generally overlain by a thin veneer of black, silty material. As described in Section 3.1 of the main report, dredging was performed only in cuts 1-8 and the southern portion of cut A (see Figure J-2 for dredged area location). In the physical description presented in Figure J-5, the logs for locations 10 and 22 in cut 9, location 23 in cut 11, and location 12 in cut 13 represent areas that were not dredged. Post-dredge cores were collected at these locations to assess if sediment conditions changed adjacent to the dredged area.

For the cores and grabs that were analyzed, the PCB concentrations (ppm as total homologues) have been overlaid on the core logs in Figure J-6. For the grabs, the PCB concentrations represent a composite of the 0-2 cm (0-0.8 inch) sediment depth. These concentrations are reported in the box above each core. For the cores, the PCB concentrations represent a composite of the 0-1 foot (0-0.3m) sediment depth. These concentrations are reported within each core.

PCB concentrations for the grabs (generally representing the black silty material) ranged from 0.47 ppm (location 2) to 470 ppm (location 31) and were generally above 100 ppm. Concentrations in the upper 1-foot (0.3m) composite from the cores ranged from 0.67 ppm (location 9) to 130 ppm (location 21) and were generally above 7 ppm. PCB concentrations were significantly higher in the grabs than in the upper 1-foot (0.3m) core composites at 16 of the 18 locations where both grabs and cores were analyzed.

A comparison of core logs and PCB concentrations for pre- and post-dredge conditions is presented in Figure J-7 for an east-west transect and in Figure J-8 for a north-south transect. For both transects, the vertical position of the post-dredge cores and post-dredge bathymetry clearly shows that dredging removed material to below the pre-dredge silt/clay boundary. Comparing the PCB concentration at a given 1-foot (0.3m) depth interval for the pre- and post-dredge cores shows that the post-dredge values are consistently higher.

PCB concentrations in surficial sediments along two transects crossing cut 1 are presented in Figure J-9. These grab samples were collected within several hours of completion of the dredging in the cut. Transect 1 ("T1" series of samples) was aligned near the northern extreme of cut 1, and transect 2 ("T2" series of samples) was aligned approximately 20 feet (6.1m) south of transect 1. See Figure J-2 for the location of the transects and sampling points. Lowest PCB concentrations were noted near the center of both transects. Concentrations increased to the east toward the overlap with the previously dredged cut 1 and to the west toward cut A which had not been dredged.

J.4.4 Geostatistics and Mass Removal

A comparison was made between the inverse-distance weighting (IDW) and kriging methods used to interpolate PCB concentrations and produce contour maps. The difference between the two methods was less than 5%; therefore, only results using the IDW method are presented in this report.

Figures J-10, J-11, and J-12 show the contoured pre-dredge PCB concentrations for the 0-1 foot, 1-2 foot, and 2-3 foot (0-0.3m, 0.3-0.6m, 0.6-0.9m) depth horizons, respectively (average concentrations over the one-foot interval). The results are tabulated for each overall depth horizon as well as just for the dredge area (Table J-7). The pre-dredge PCB concentrations decreased significantly with depth in the study area (e.g., 857 ppm to 26 ppm between the 0-1 foot (0-0.3m) and 2-3 (0.6-0.9m) foot depth horizons), indicating that the PCBs in this area are not being buried, or diluted, by clean sediment over time. These concentrations were used to set the target depth for the dredging (depth with a PCB concentration less than 10 ppm).

The post-dredge PCB concentration contours are presented in Figure J-13 and in Table J-7. As described in Section 3 of the main report, the dredge removed from 1 foot to more than 3 feet of sediment over the test area down to the targeted clean horizon.

These data were used to calculate the mass of PCBs removed from the dredge area (Table J-8). The mass of sediment for each horizon was determined and multiplied by the average PCB concentration within each horizon to calculate the mass of PCBs within that horizon. The mass was summed for each pre-dredge layer to determine the total pre-dredge PCB mass within the dredge area. The post-dredge mass was divided by the pre-dredge mass to calculate the overall PCB mass removal efficiency. The results indicate that approximately 97% of the PCB mass was removed from the test area during this dredging study.

J.5 DISCUSSION

The Pre-Design Field Test was designed to, among other goals, determine the ability of the proposed dredge system (as described in Section 2.3 of the main report) to remove contaminated sediment without causing adverse ecological or human health effects. Efficiency was determined based on the ability to remove PCB-contaminated sediment down to the 10 ppm depth horizon. Based on pre-dredge sediment cores, a dredging plan was established to accomplish this. Two measurement endpoints were identified to evaluate this technology. The first was to compare the volume of sediment actually removed to the estimated volume to be removed based on the original dredge plan. This was accomplished using bathymetric data before and after the dredging to determine how effectively the dredge performed (Section 3.0). Comparison of the target dredge volume with the actual volume dredged yielded an overdredging value of only 16%, with vertical accuracy of +/- 4 inches relative to achieving the intended horizon.

A second endpoint designed to evaluate removal efficiency included determining the sediment PCB concentrations before and after dredging to calculate overall PCB removal efficiency of the dredge. The dredge was very efficient in this regard. The results indicate that approximately 97% of the PCB mass was removed within the dredging boundaries. The average PCB concentration in the upper one-foot of sediments was reduced from 857 ppm to 29 ppm over the dredged test area. This met the clean up criteria of 50 ppm for the Lower Harbor and approached the criteria of 10 ppm for the Upper Harbor. It should be understood that the PDFT goal was **not** to leave a final sediment concentration of 10 ppm as this was a field test, **not** a remedial operation. Rather, the PDFT did have a goal of identifying potential mechanisms responsible for not reaching the 10 ppm cleanup level under the specific conditions of the PDFT.

During the design phase of this project, it was determined that most sediments within the dredge test area had a high water and silt/clay content. This fact introduced the possibility that some contaminated sediment within or immediately adjacent to the dredge area could be mobilized during the dredging process and potentially re-contaminate the dredged area. Mechanisms that could mobilize the sediments include bucket impact on the bottom, loss through the water column (appears minimal for the hydraulic excavator), anchor wire/spud repositioning, and material sloughing down slope along the sides of a dredged cut. Furthermore, other factors such as tidal currents and meteorological events (e.g., wind) could produce the same effect due to re-suspended contaminated sediments migrating from other areas of the harbor. The sediment characterization program included the collection of surface grabs in addition to cores in an effort to quantify the effects of sediment mobilization.

Based on the visual observations of the upper surface of the cores and grab samples and the results of laboratory analyses, some recontamination did occur within the test area. The relevant question with respect to dredge efficiency is to evaluate whether the post-dredge PCB concentrations were due to mobilized sediments settling out over the dredged area or due to undredged material (i.e., not all the material was removed by the dredge). Table J-9 presents a calculation of the how much surficial re-contamination, via a given mechanism (i.e., tide, wind), would be required to produce PCB concentrations above 10 ppm (upper one foot composite) in a previously clean area.

Assuming that an area were dredged to a clean (i.e., 0 ppm PCB) depth horizon, only a very thin layer of re-deposited, contaminated PCB sediment would be required to increase the concentration within a composited upper 1-foot (0.3 m) sediment core to greater than 10 ppm (Table J-9). For example, if the sediment adjacent to a clean dredge area has a PCB concentration of 4,000 ppm, it would require only a 0.03-inch (0.08cm) layer of newly deposited (post-dredging) contaminated sediment to elevate the average concentration of the upper one foot of clean sediment above 10 ppm. If the adjacent sediment PCB concentrations were between 500 and 1,000 ppm, which was the case in many parts of the test area, it would require only 0.12 inches to 0.24 inches (0.30 to 0.61cm) of newly deposited contaminated sediment to elevate the average concentration of the upper one foot of clean sediment above 10 ppm.

This thickness of contaminated silty material (only a thin veneer) is consistent with field observations made at the time of grab sample collection. The grab sampler penetrated approximately 6 inches (15 cm) into the sediment. Once retrieved, the top of the sampler was opened, and a portion of the upper 0.8 inches (2 cm) of sediment was removed for analysis. This allowed for visual inspection of the upper sediment profile within the sampler. Based on this information, it appears that the observed average post-dredge PCB concentration (29 ppm upper one foot of composite) can be attributed to deposition of mobilized sediments (either from the original dredged area or from adjacent areas by sloughing, tidal action, etc.), rather than inefficient or inaccurate dredging.

In summary, both the sediment removal data (presented in Section 3.0) and PCB data presented in this Appendix indicate that this dredging technology is very efficient at contaminated sediment removal. The results indicate that 97% of the PCB mass was removed over the test area, and the remaining sediment concentrations approached the site specific clean up criteria. The PCB mass remaining after dredging appeared to reside entirely in a thin surface veneer and was attributed to recontamination of the dredged area rather than incomplete removal. Adjustments to dredging and operational controls will reduce the influence of many potential recontamination mechanisms. Therefore, during full-scale dredging, a corresponding reduction in surficial sediment recontamination is expected.

J.6 REFERENCES

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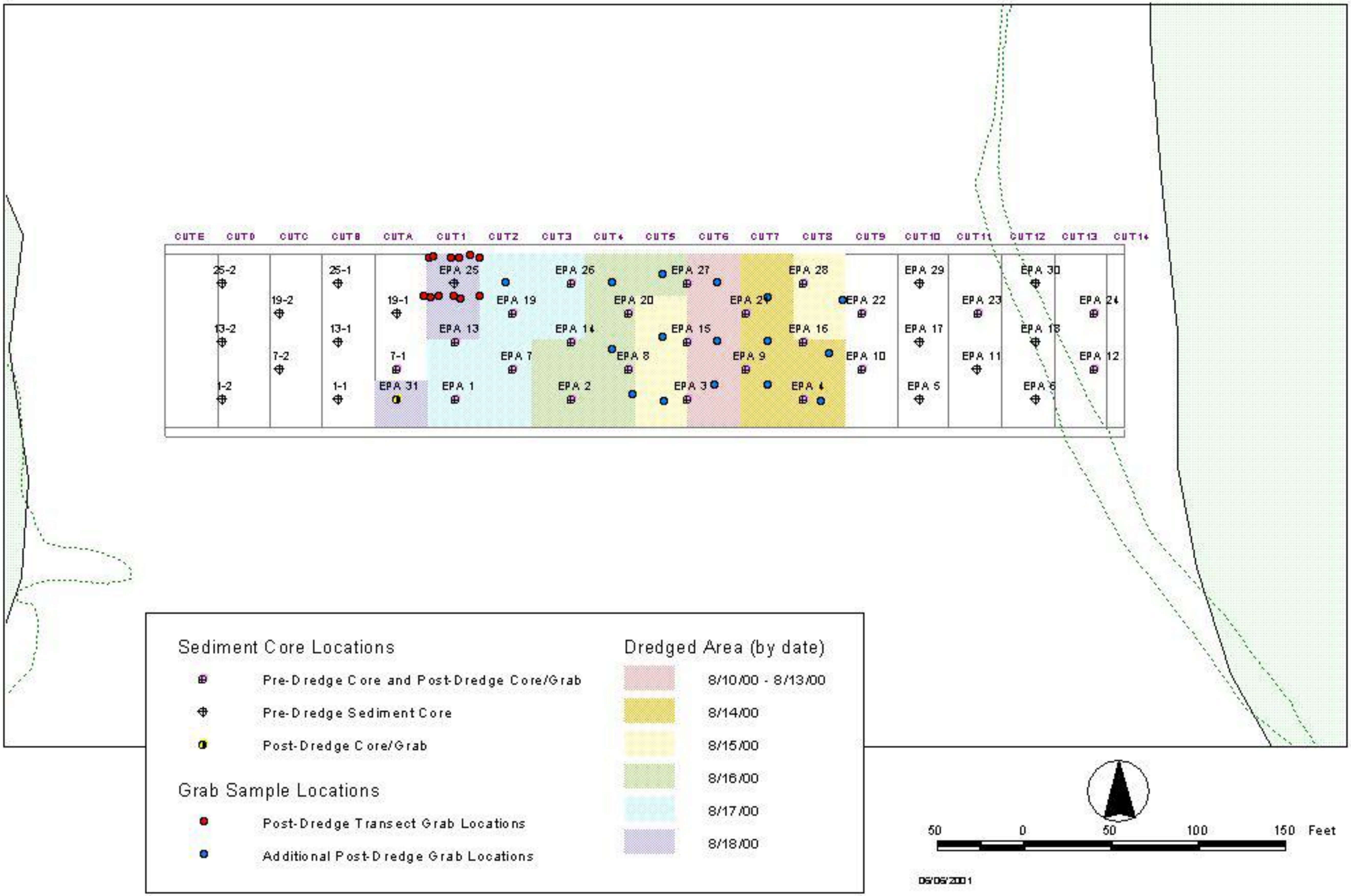
ENSR INTERNATIONAL

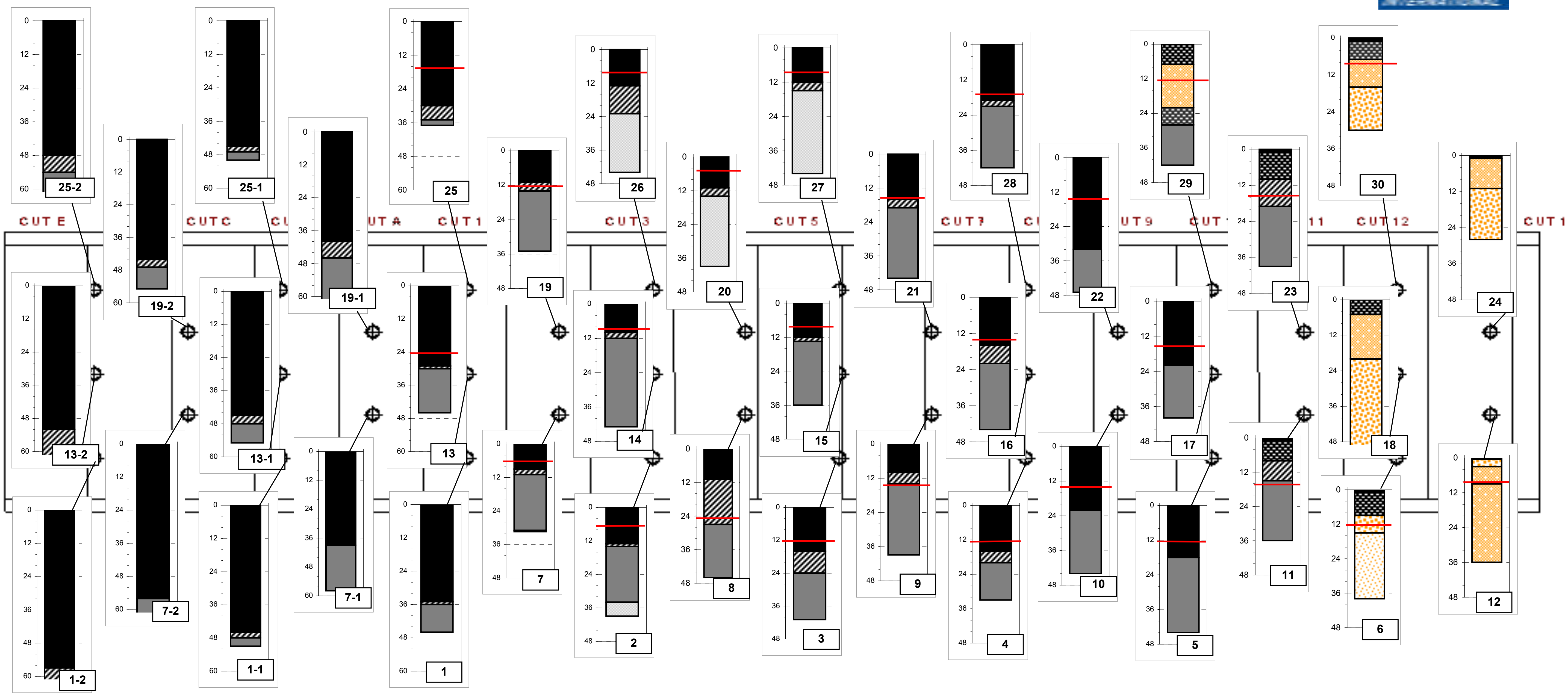
U.S. Army Corps of Engineers
New Bedford Harbor Superfund Project

Figure J-1 Upper New Bedford Harbor Showing Pre-Design Field Test Area



U.S. Army Corps of Engineers - New Bedford Harbor Superfund Project
Figure J-2: Sediment Sampling Locations

U.S. Army Corps of Engineers
New Bedford Harbor Superfund Site - Pre-Design Field Investigation



Visual Classification of Sediment Type

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may an be artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand
- Color change noted by lab after removing outer layer

Notes

Depths are in inches from the sediment surface.

Samples 1-1, 1-2, 7-1, 7-2, 13-1, 13-2, 19-1, 19-2, 25-1, and 25-2 were collected 7-8, August 2000.
All other cores were collected on 13-15, June 2000.

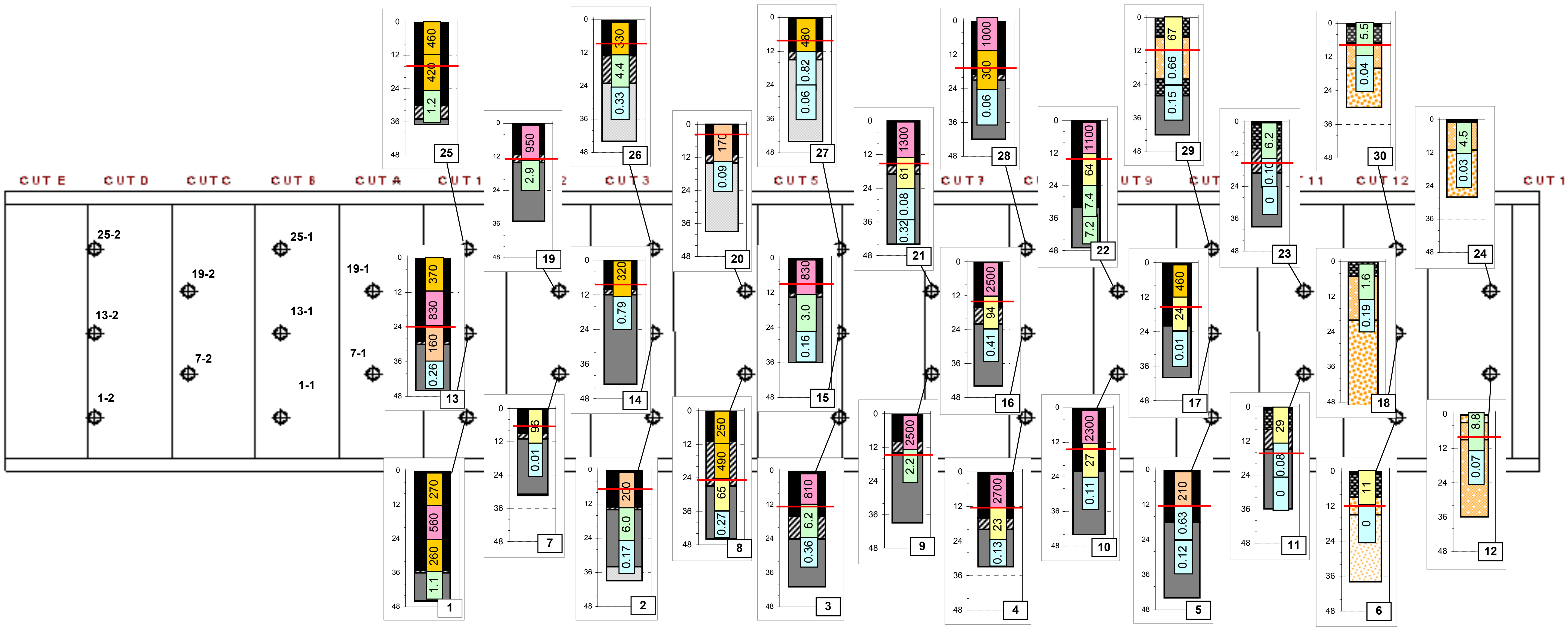
Core 9: Laboratory noted that a piece of wood was through core cross-section.

Core 24: 1-11" is a mix of silt/sand and coarse sand with a slight gradation from dark to light.

Total length of core 7-2: 73"
Total length of core 1-2: 81"
Total length of core 13-2: 76"
Total length of core 19-1: 65"
Total length of core 25-2: 72.5"

Figure J-3
Pre-Dredge Core Logs
06-06-01

U.S. Army Corps of Engineers
New Bedford Harbor Superfund Site - Pre-Design Field Investigation



Visual Classification of Sediment Type

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may be an artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand
- Color change noted by lab after removing outer layer.

Notes

Depths are in inches from the sediment surface.
All PCB data have been surrogate-corrected.
Background stratigraphy is based on field observations.

Total PCB (ppm as total homologues[1])

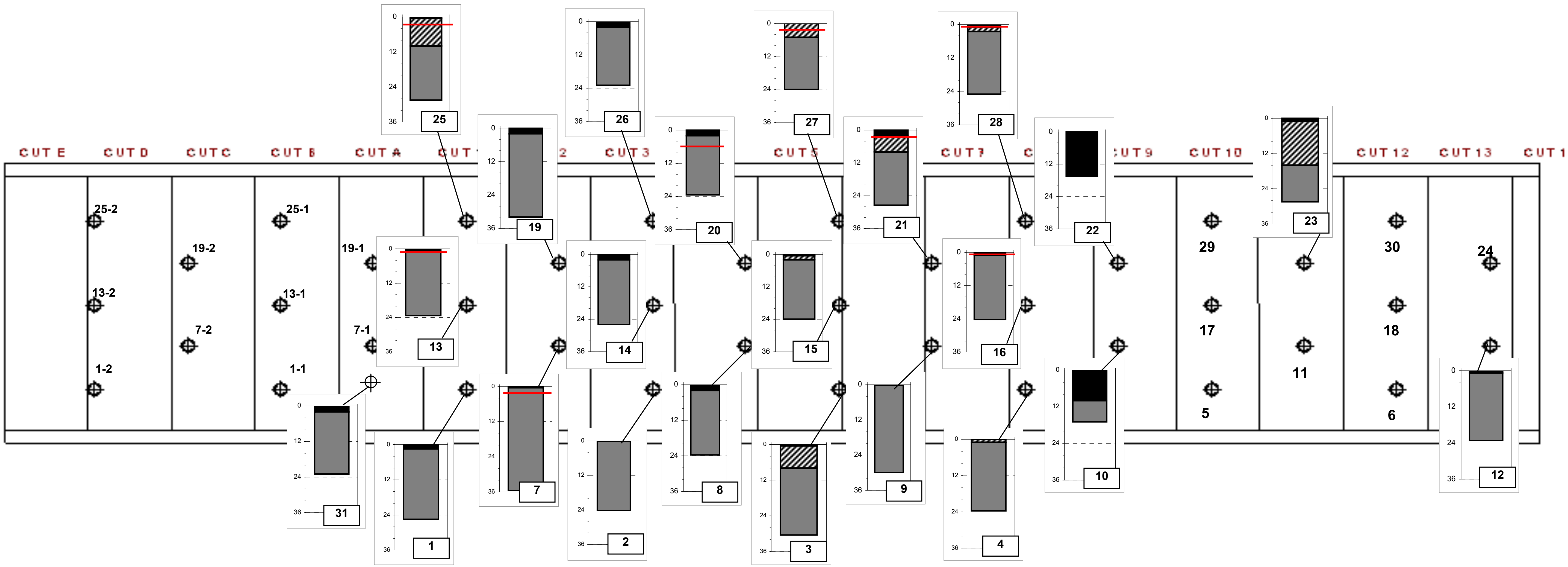
- 0 < 1 ppm
- 7 1-10 ppm
- 46 11-100 ppm
- 150 101-250 ppm
- 300 251-500 ppm
- 1062 > 500 ppm

[1] Calculated using Foster Wheeler's (February 2001) regression equation.
Total PCBs as homologues = NOAA 18 sum (ppm) * 2.5

Figure J-4
Pre-Dredge Core Logs+PCB
06-06-01

FigJ4-CoreLogPlots_June2000_wPCBSurgCor

U.S. Army Corps of Engineers
New Bedford Harbor Superfund Site - Pre-Design Field Investigation



Visual Classification of Sediment Type

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may be an artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand
- Color Change noted by lab after removing outer layer, for top 12" only.

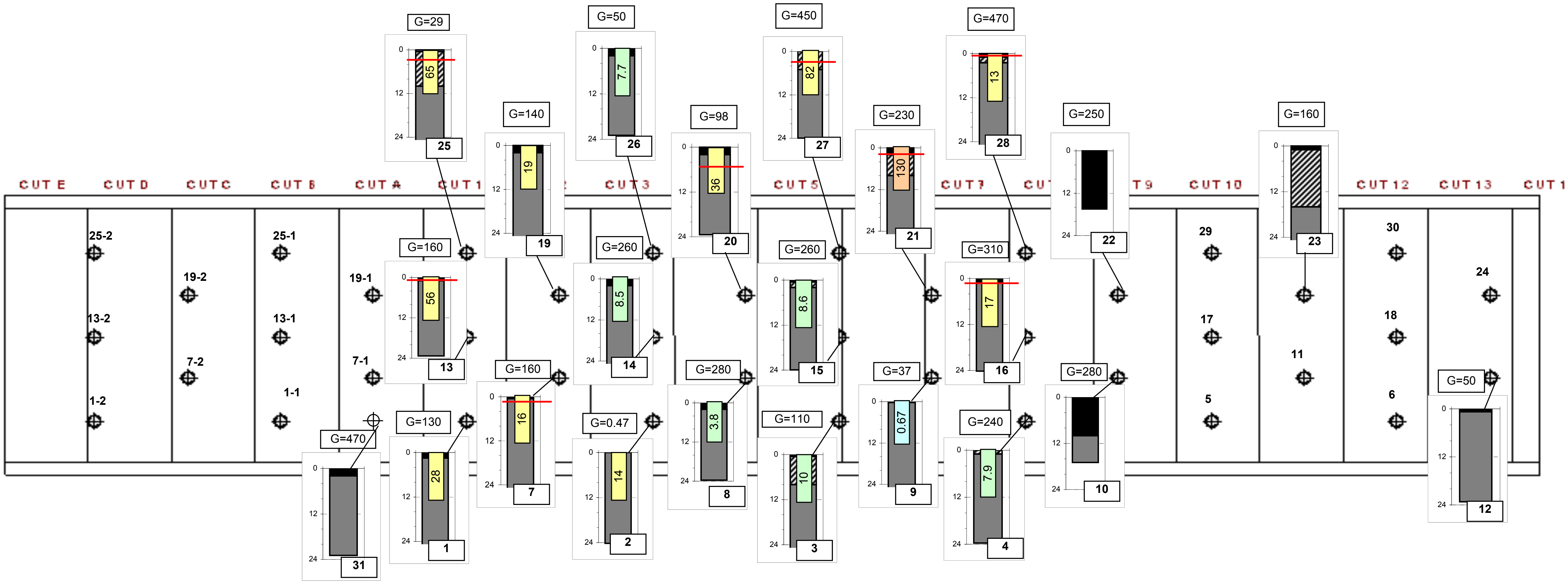
Notes

Depths are in inches from the sediment surface.
Cores were collected on 17, 18, 21 August 2000.
Cores 10, 12, 22, 23 were collected from area not dredged.

Figure J-5
Post-Dredge Core Logs
06-06-01

FigJ5-CoreLogPlots_August2000_Visual

U.S. Army Corps of Engineers
New Bedford Harbor Superfund Site - Pre-Design Field Investigation



Visual Classification of Sediment Type

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may be an artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand
- Color Change noted by lab after removing outer layer, for top 12" only.

Notes

Depths are in inches from the sediment surface.
All PCB data have been surrogate-corrected.
"G" = Grab samples were collected from a depth of 0-2cm.
All PCB concentrations are expressed in ppm as total homologues.[1]
Cores 10, 12, 22, 23 were collected from an undredged area.
Background stratigraphy is based on field observations.

Total PCB (ppm as total homologues[1])

- 0 — < 1 ppm
- 7 — 1-10 ppm
- 46 — 11-100 ppm
- 150 — 101-250 ppm
- 300 — 251-500 ppm
- 1062 — > 500 ppm

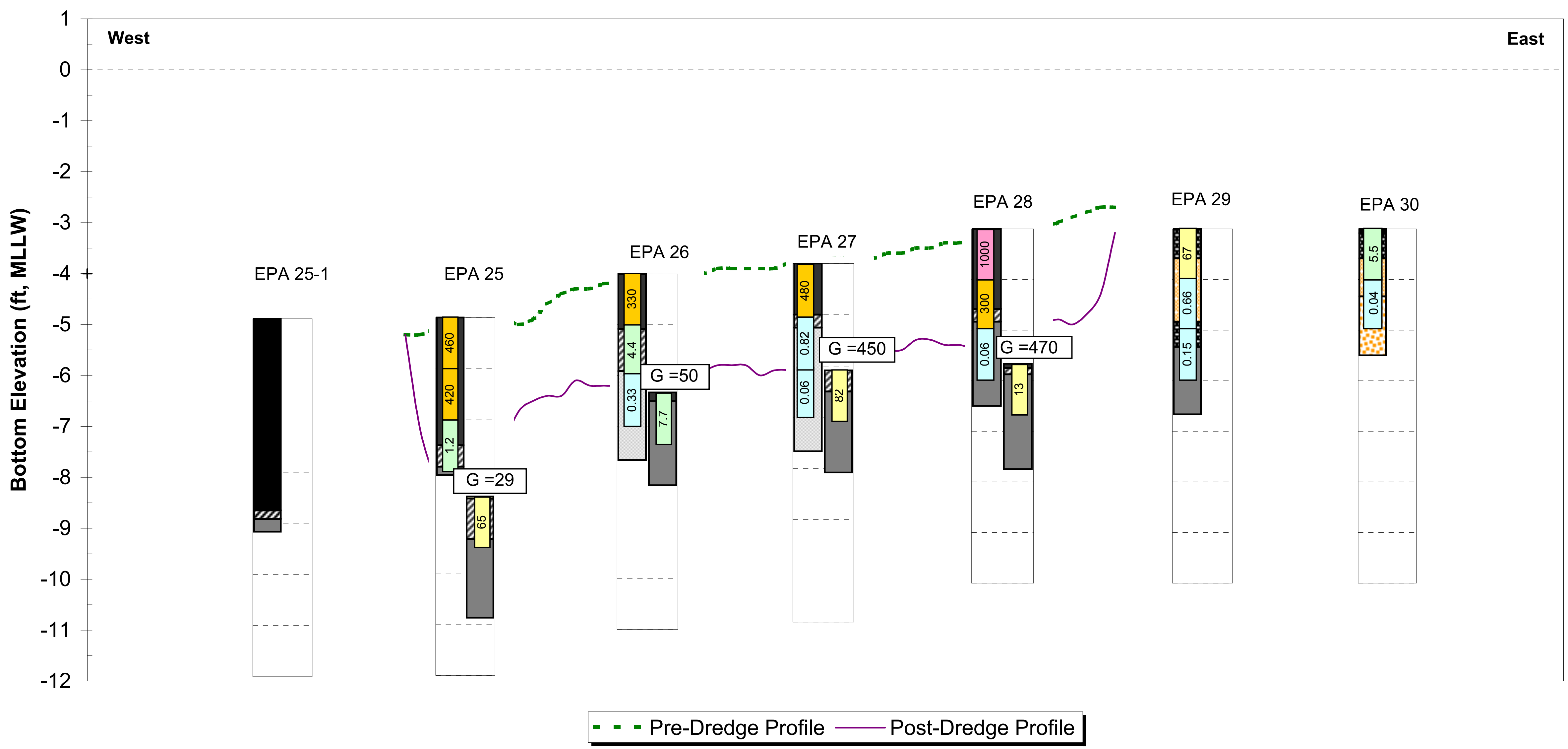
[1] Calculated using Foster Wheeler's (February 2001) regression equation.
Equation used:
Total PCBs as homologues = NOAA 18 sum (ppm) * 2.5

Figure J-6

Post-Dredge Core Logs+ PCB (Cores and Grabs)

06-06-01

FigJ6-CoreLogPlots_August2000_pcb2



Visual Classification of Sediment Types

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may be an artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand

Notes

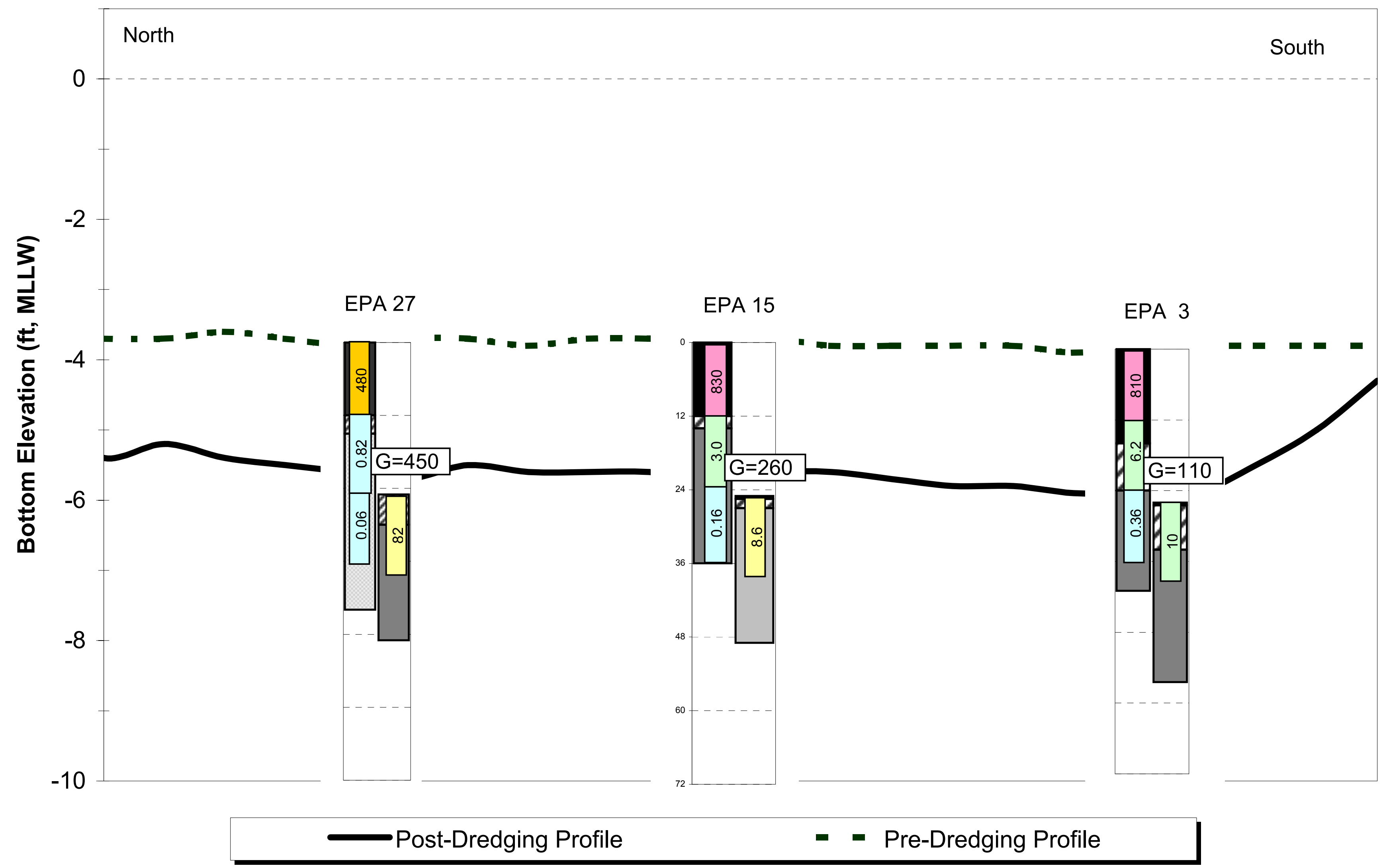
Depths are in inches from the sediment surface.
All PCB data have been surrogate-corrected.
"G"= Grab samples were collected at a depth of 0-2cm
All PCB concentrations are expressed in ppm as total homologues.1
Background stratigraphy is based on field observations.

Total PCB (ppm as total homologues[1])

- 0 < 1 ppm
- 7 1-10 ppm
- 46 11-100 ppm
- 150 101-250 ppm
- 300 251-500 ppm
- 1062 > 500 ppm

[1] Calculated using Foster Wheeler's (February 2001) regression equation.
Equation used:
Total PCBs as homologues = NOAA 18 sum (ppm) * 2.5

Figure J-7
Pre- and Post- Dredge Core Logs Along East-West Transect
06-06-01



Visual Classification of Sediment Type

- Black-Very Fine (most with obvious H_2S and/or petroleum odor).
- Dark Grey-Fine
- Transition Layer (may be an artifact of coring)
- Grey Fines
- Light Grey Fines
- Silty Sand
- Coarse Sand
- Fine Sand

Notes

Depths are in inches from sediment surface
All PCB data have been surrogate-corrected.
"G" = Grab samples were collected from a depth of 0-2cm.
All PCB concentrations are expressed in ppm as total homologues.[1]
Pre- and Post- Bathymetry data was provided by Bean Environmental.
Background stratigraphy is based on field observations.

Total PCB (ppm as total homologues[1])

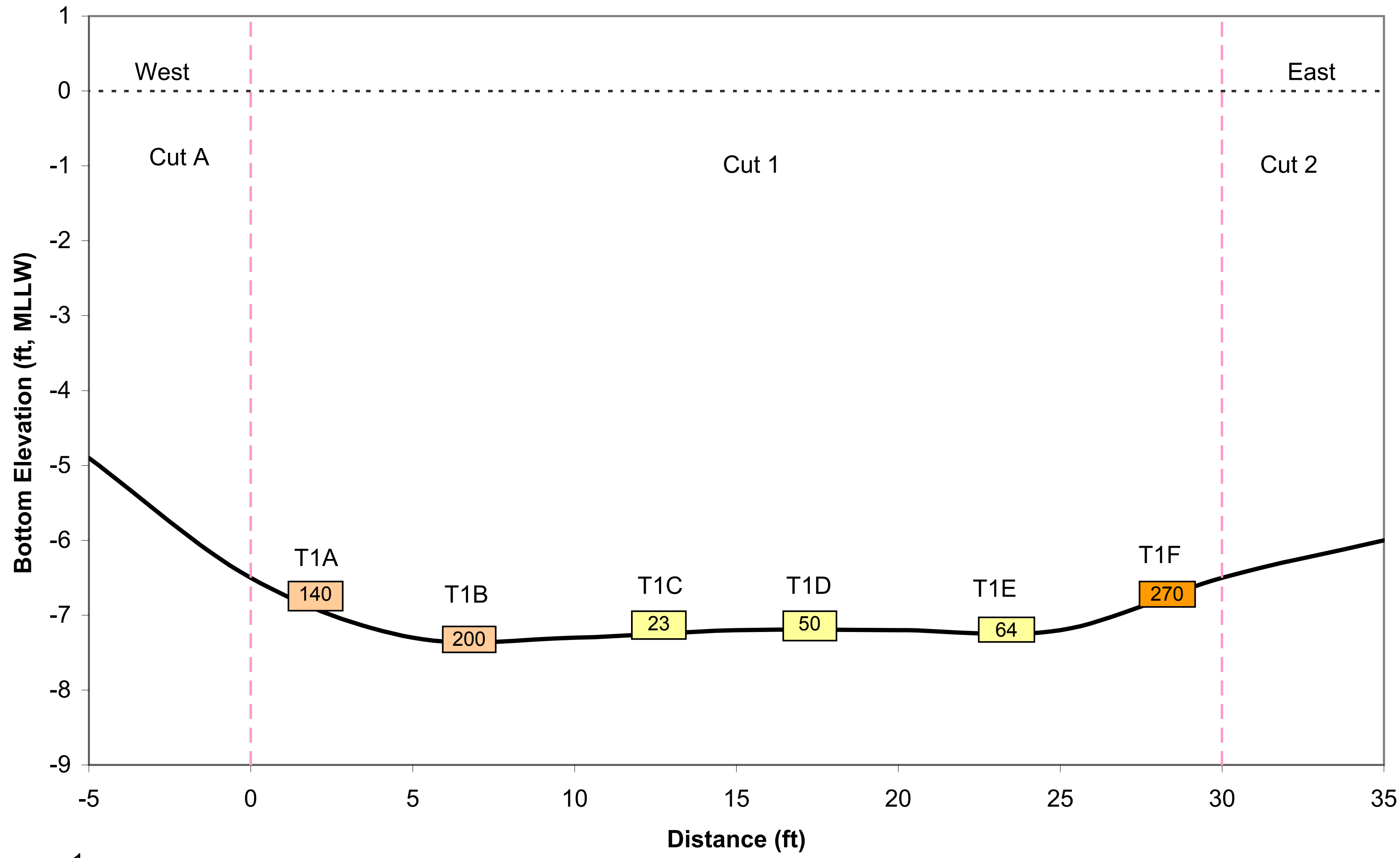
0	< 1 ppm
7	1-10 ppm
46	11-100 ppm
150	101-250 ppm
300	251-500 ppm
1062	> 500 ppm

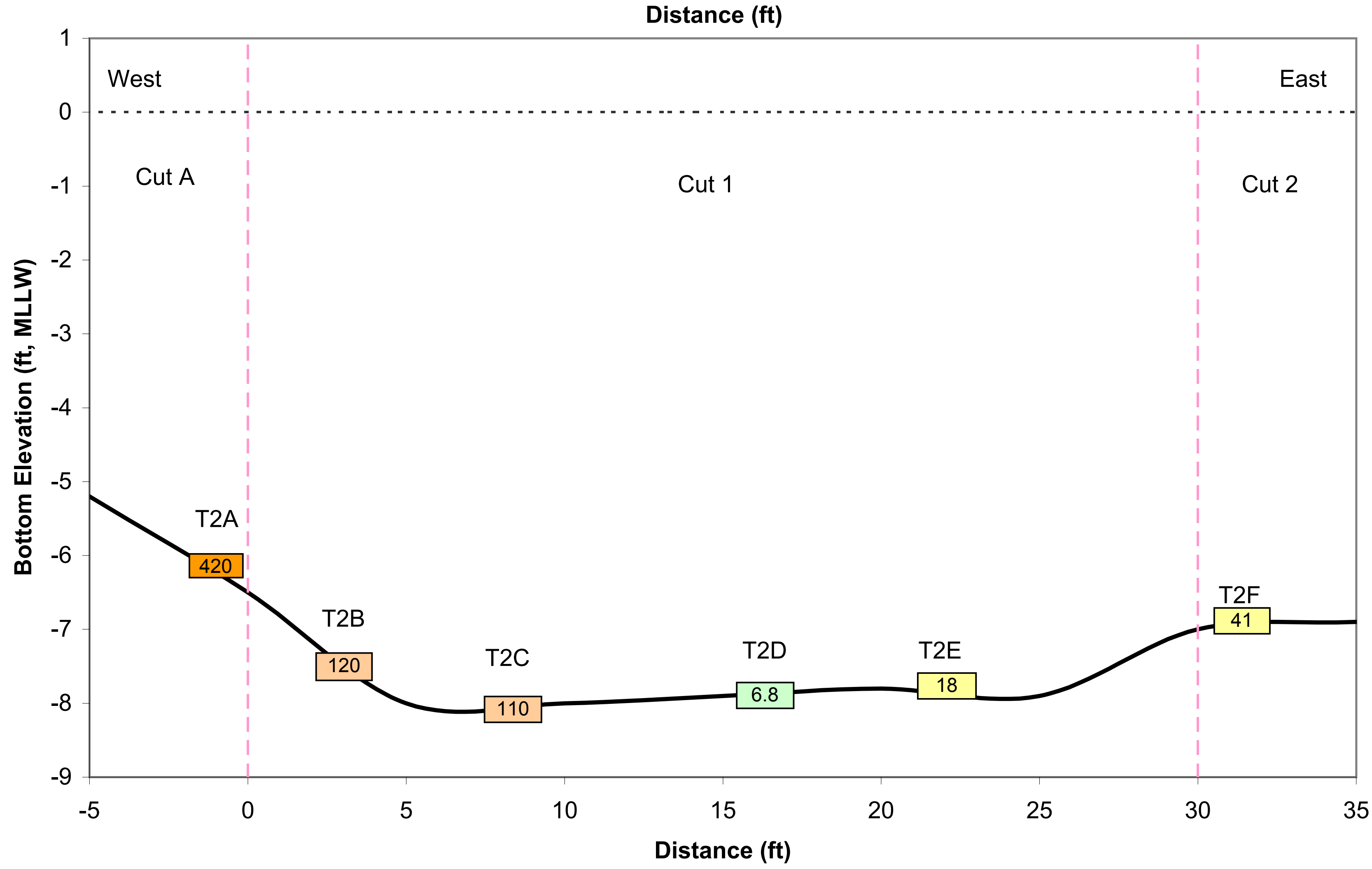
[1] Calculated using Foster Wheeler's (February 2001) regression equation.
Equation used:
Total PCBs as homologues = NOAA 18 sum (ppm) * 2.5

Figure J-8

Pre- and Post- Dredge Core Logs Along North-South Transect

06-06-01





Total PCB (ppm as total homologues[1])

- 0 — < 1 ppm
- 7 — 1-10 ppm
- 46 — 11-100 ppm
- 150 — 101-250 ppm
- 300 — 251-500 ppm
- 1062 — > 500 ppm

[1] Calculated using Foster Wheeler's (February 2001) regression equation.
Equation used:
Total PCBs as homologues = NOAA 18 sum (ppm) * 2.5

Notes
All PCB data have been surrogate-corrected.
Grab samples were collected from a depth of 0-2cm.
Bathymetry data provided by Bean Environmental.

Figure J-9
PCB Concentration in Post-Dredge Surficial Sediments Across Cut 1.
06-06-01

Figure J-10. Pre-dredge PCB concentration contours based on inverse-distance weighting interpolation; 0-1’ depth sediment horizon.

EPA
AED, Narragansett RI

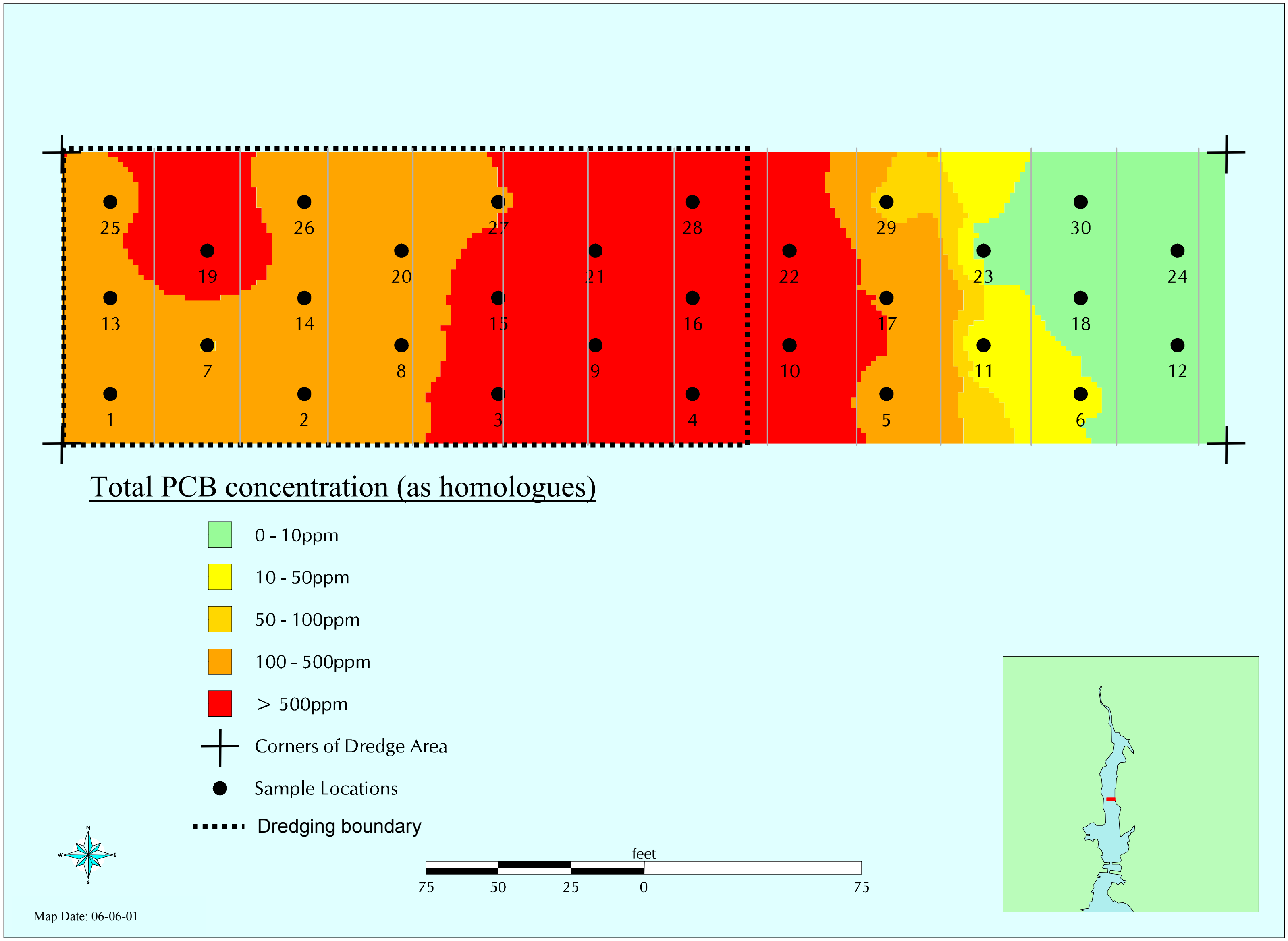


Figure J-11. Pre-dredge PCB concentration contours based on inverse-distance weighting interpolation; 1-2' depth sediment horizon.

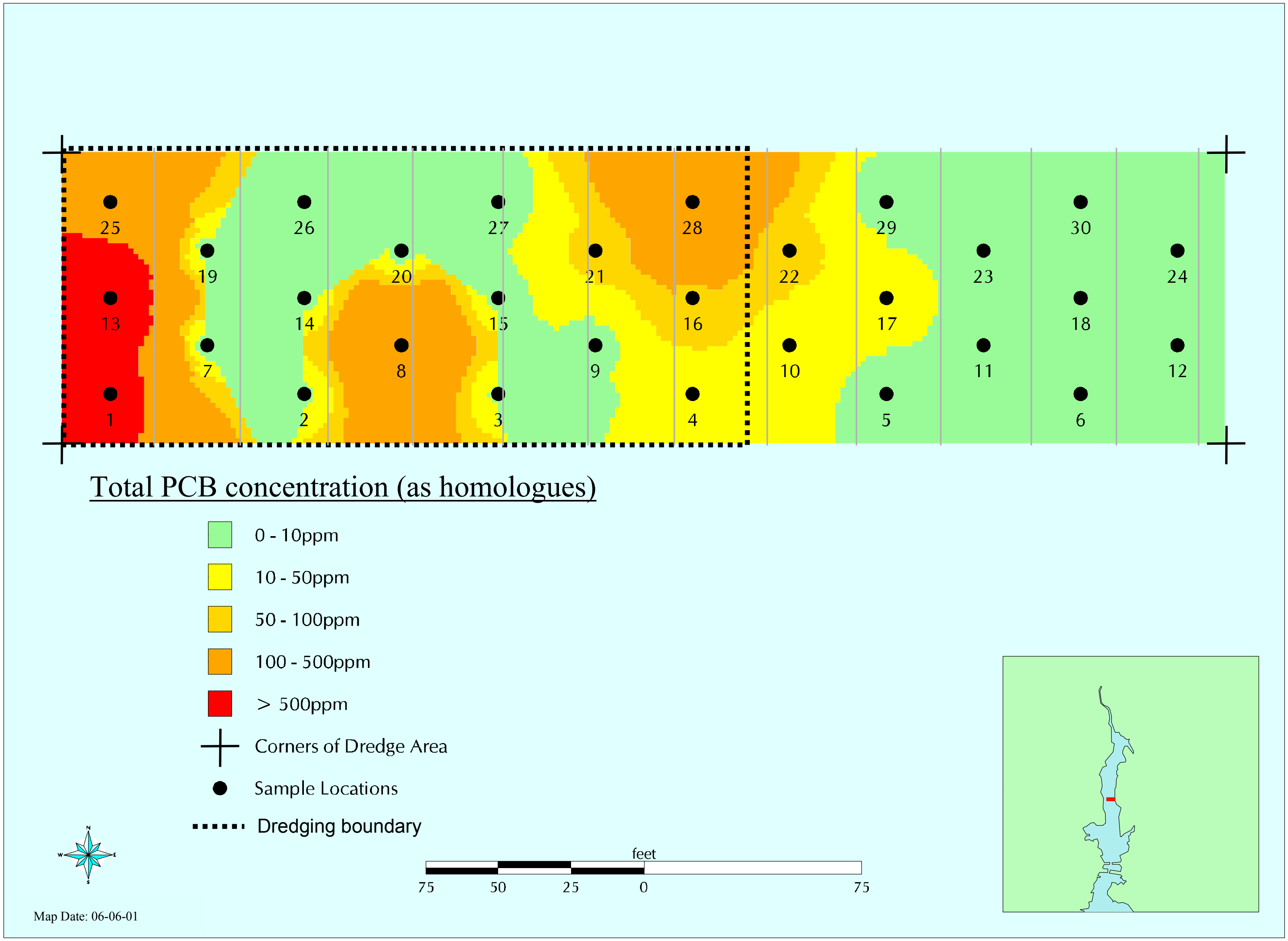


Figure J-12. Pre-dredge PCB concentration contours based on inverse-distance weighting interpolation; 2-3' depth sediment horizon.

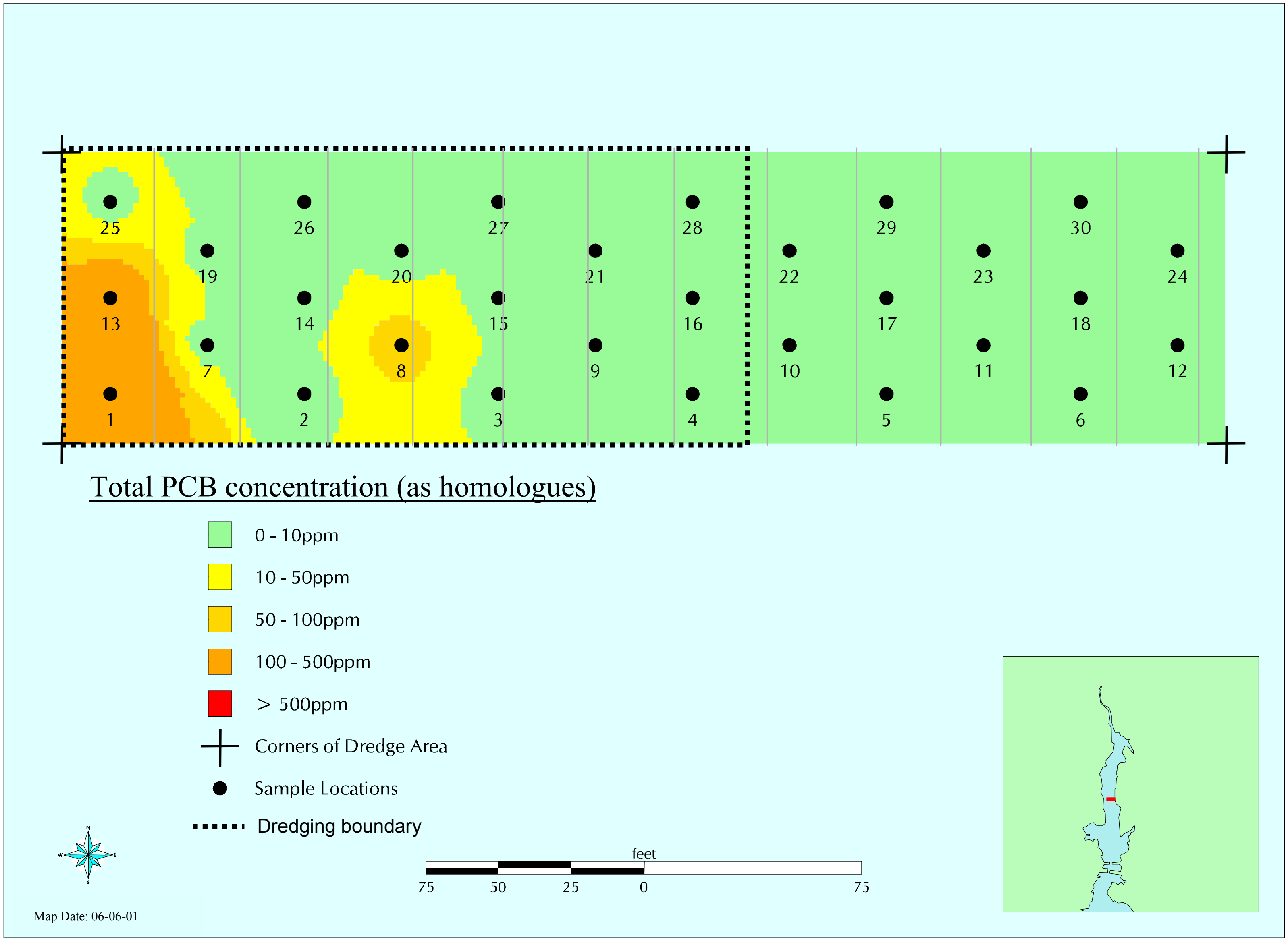
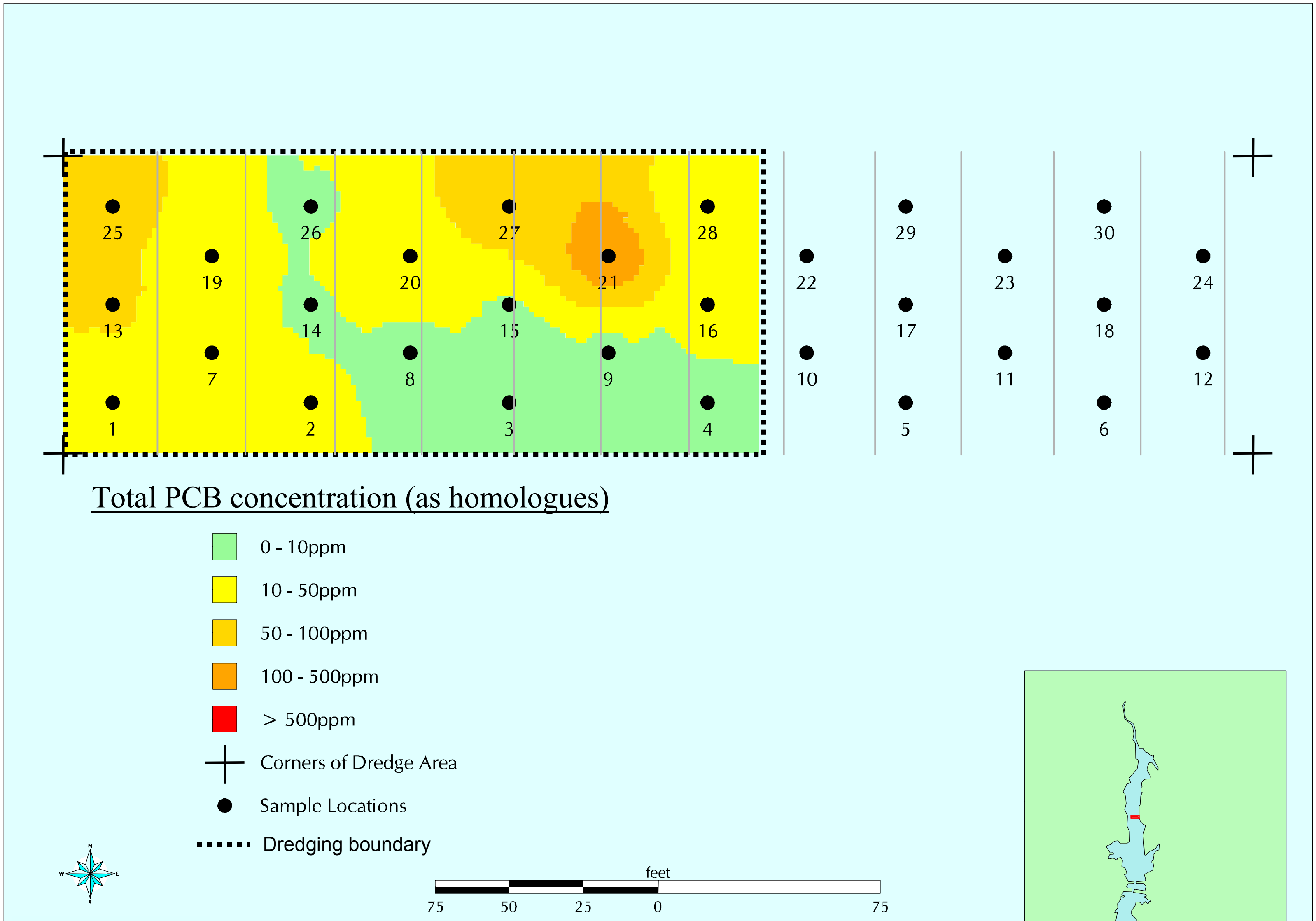


Figure J-13. Post-dredge PCB concentration contours based on inverse-distance weighting interpolation; 0-1’ depth sediment horizon.

AED, Narragansett RI



Map Date: 06-06-01

Table J-1 Pre- and Post-Dredge Target and Actual Coordinates

LOCATION	TARGET		ACTUAL PRE-DREDGE		ACTUAL POST-DREDGE[1]	
CORES	Easting (ft)	Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)	Northing (ft)
EPA 1	815266.667	2703966.875	815267.700	2703969.800	815265.330	2703967.360
EPA 2	815333.334	2703966.875	815333.500	2703965.900	815331.872	2703965.571
EPA 3	815400.001	2703966.875	815400.400	2703967.500	815398.512	2703965.958
EPA 4	815466.668	2703966.875	815466.000	2703965.700	815465.313	2703968.892
EPA 5	815533.335	2703966.875	815533.000	2703966.500	N/A	N/A
EPA 6	815600.002	2703966.875	815600.400	2703965.600	N/A	N/A
EPA 7	815300.000	2703983.750	815299.500	2703984.600	815300.001	2703983.030
EPA 8	815366.667	2703983.750	815366.200	2703984.800	815365.937	2703983.204
EPA 9	815433.334	2703983.750	815433.500	2703983.800	815433.809	2703983.905
EPA 10	815500.001	2703983.750	815499.700	2703985.600	815500.285	2703984.554
EPA 11	815566.668	2703983.750	815565.700	2703983.000	N/A	N/A
EPA 12	815633.335	2703983.750	815633.400	2703985.300	815632.415	2703984.431
EPA 13	815266.667	2704000.000	815266.500	2703999.200	815265.563	2704001.617
EPA 14	815333.334	2704000.000	815333.700	2703999.600	815334.980	2704000.900
EPA 15	815400.001	2704000.000	815399.000	2703998.800	815399.148	2704000.822
EPA 16	815466.668	2704000.000	815468.000	2703999.400	815467.099	2704000.167
EPA 17	815533.335	2704000.000	815532.600	2704000.000	N/A	N/A
EPA 18	815600.002	2704000.000	815600.700	2703999.400	N/A	N/A
EPA 19	815300.000	2704016.250	815300.900	2704015.400	815299.414	2704015.824
EPA 20	815366.667	2704016.250	815366.700	2704017.600	815367.012	2704016.693
EPA 21	815433.334	2704016.250	815433.300	2704016.900	815433.051	2704015.220
EPA 22	815500.001	2704016.250	815501.000	2704016.200	815499.313	2704017.365
EPA 23	815566.668	2704016.250	815567.200	2704016.300	815566.502	2704017.294
EPA 24	815633.335	2704016.250	815632.200	2704015.600	N/A	N/A
EPA 25	815266.667	2704033.125	815264.500	2704032.300	815268.735	2704033.197
EPA 26	815333.334	2704033.125	815332.000	2704031.700	815333.133	2704033.932
EPA 27	815400.001	2704033.125	815400.800	2704032.600	815400.616	2704033.088
EPA 28	815466.668	2704033.125	815467.800	2704034.800	815466.762	2704033.132
EPA 29	815533.335	2704033.125	815533.300	2704033.600	N/A	N/A
EPA 30	815600.002	2704033.125	815598.100	2704033.900	N/A	N/A
EPA 31 (added pt.)	815233.333	2703966.875	N/A	N/A	815233.611	2703966.810
1-1	815200.000	2703966.875	815199.120	2703965.471	N/A	N/A
1-2	815133.333	2703966.875	815133.418	2703965.458	N/A	N/A
7-1	815233.333	2703983.750	815234.828	2703984.189	N/A	N/A
7-2	815166.666	2703983.750	815166.608	2703985.084	N/A	N/A
13-1	815200.000	2704000.000	815200.899	2703999.829	N/A	N/A
13-2	815133.333	2704000.000	815131.900	2703999.228	N/A	N/A
19-1	815233.333	2704016.250	815232.500	2704015.069	N/A	N/A
19-2	815166.666	2704016.250	815167.025	2704017.042	N/A	N/A
25-1	815200.000	2704033.125	815201.087	2704032.218	N/A	N/A

Table J-1 Pre- and Post-Dredge Target and Actual Coordinates

LOCATION	TARGET		ACTUAL PRE-DREDGE		ACTUAL POST-DREDGE[1]	
CORES	Easting (ft)	Northing (ft)	Easting (ft)	Northing (ft)	Easting (ft)	Northing (ft)
25-2	815133.333	2704033.125	815133.301	2704031.537	N/A	N/A
T2A	N/A	N/A	N/A	N/A	815249.211	2704025.219
T2A-2	N/A	N/A	N/A	N/A	815248.427	2704025.826
T2B*	N/A	N/A	N/A	N/A	815253.185	2704026.004
T2B-2	N/A	N/A	N/A	N/A	815252.080	2704024.824
T2C*	N/A	N/A	N/A	N/A	815258.725	2704025.804
T2C-2	N/A	N/A	N/A	N/A	815257.119	2704025.838
T2D*	N/A	N/A	N/A	N/A	815266.216	2704025.354
T2D-2	N/A	N/A	N/A	N/A	815265.423	2704025.394
T2E*	N/A	N/A	N/A	N/A	815271.967	2704025.413
T2E-2	N/A	N/A	N/A	N/A	815269.517	2704023.687
T2F*	N/A	N/A	N/A	N/A	815281.376	2704025.957
T2F-2	N/A	N/A	N/A	N/A	815280.216	2704025.472
T1A*	N/A	N/A	N/A	N/A	815251.179	2704046.500
T1A-2	N/A	N/A	N/A	N/A	815251.534	2704047.544
T1B*	N/A	N/A	N/A	N/A	815256.550	2704048.625
T1B-2	N/A	N/A	N/A	N/A	815253.712	2704047.834
T1C*	N/A	N/A	N/A	N/A	815262.550	2704046.305
T1C-2	N/A	N/A	N/A	N/A	815263.656	2704047.327
T1D*	N/A	N/A	N/A	N/A	815267.186	2704047.876
T1D-2	N/A	N/A	N/A	N/A	815268.924	2704047.773
T1E*	N/A	N/A	N/A	N/A	815273.201	2704046.615
T1E-2	N/A	N/A	N/A	N/A	815274.684	2704048.700
T1F*	N/A	N/A	N/A	N/A	815278.036	2704046.081
T1F-2	N/A	N/A	N/A	N/A	815280.085	2704047.684
C2N*	N/A	N/A	N/A	N/A	815295.408	2704033.377
C2M*	N/A	N/A	N/A	N/A	Not noted	Not noted
C5S*	N/A	N/A	N/A	N/A	815385.776	2703965.274
C5N*	N/A	N/A	N/A	N/A	815385.464	2704037.880
C5M*	N/A	N/A	N/A	N/A	815385.434	2704001.859
C4S*	N/A	N/A	N/A	N/A	815368.189	2703969.293
C4N*	N/A	N/A	N/A	N/A	815356.412	2704033.442
C4M*	N/A	N/A	N/A	N/A	815356.017	2703994.701

[1] Post-dredge coordinates include collection of both core and grab except where noted by an asterisk (*) only a grab was collected
N/A - No core or grab sample collected

Table J-2 Summary of Collection Efforts

Date	Sites	Time	Method
PRE-DREDGE			
13-Jun-00	EPA-25	16:22	TG&B Push Core from TG&B Skiff
	EPA-19	16:50	TG&B Push Core from TG&B Skiff
14-Jun-00	EPA-26	8:47	TG&B Push Core from TG&B Skiff
	EPA-20	9:07	TG&B Push Core from TG&B Skiff
	EPA-27	9:54	TG&B Push Core from TG&B Skiff
	EPA-21	10:12	TG&B Push Core from TG&B Skiff
	EPA-28	10:24	TG&B Push Core from TG&B Skiff
	EPA-16	10:42	TG&B Push Core from TG&B Skiff
	EPA-4	10:54	TG&B Push Core from TG&B Skiff
	EPA-9	11:04	TG&B Push Core from TG&B Skiff
	EPA-15	11:19	TG&B Push Core from TG&B Skiff
	EPA-3	14:09	TG&B Push Core from TG&B Skiff
	EPA-8	14:45	TG&B Push Core from TG&B Skiff
	EPA-14	15:03	TG&B Push Core from TG&B Skiff
	EPA-2	15:40	TG&B Push Core from TG&B Skiff
	EPA-7	16:04	TG&B Push Core from TG&B Skiff
	EPA-13	16:20	TG&B Push Core from TG&B Skiff
	EPA-1	16:35	TG&B Push Core from TG&B Skiff
15-Jun-00	EPA-12	9:02	TG&B Push Core from TG&B Skiff
	EPA-24	9:37	TG&B Push Core from TG&B Skiff
	EPA-30	10:22	TG&B Push Core from TG&B Skiff
	EPA-18	10:49	TG&B Push Core from TG&B Skiff
	EPA-11	11:35	TG&B Push Core from TG&B Skiff
	EPA-23	11:45	TG&B Push Core from TG&B Skiff
	EPA-29	12:10	TG&B Push Core from TG&B Skiff
	EPA-22	15:28	TG&B Push Core from TG&B Skiff
	EPA-10	15:51	TG&B Push Core from TG&B Skiff
	EPA-5	16:08	TG&B Push Core from TG&B Skiff
	EPA-17	16:24	TG&B Push Core from TG&B Skiff
	EPA-6	16:43	TG&B Push Core from TG&B Skiff
16-Jun-00	EPA-18	8:15	TG&B Vibracore from TG&B Skiff
	EPA-6	8:37	TG&B Vibracore from TG&B Skiff
7-Aug-00	EPA-16	12:43	TG&B Push Core from TG&B Skiff (collected for Bean, not analyzed)
	EPA-28	13:09	TG&B Push Core from TG&B Skiff (collected for Bean, not analyzed)
	7-1	14:50	TG&B Push Core from TG&B Skiff
	19-1	15:25	TG&B Push Core from TG&B Skiff
8-Aug-00	1-1	7:46	TG&B Push Core from TG&B Skiff
	13-1	8:08	TG&B Push Core from TG&B Skiff
	25-1	8:42	TG&B Push Core from TG&B Skiff
	19-2	9:00	TG&B Push Core from TG&B Skiff
	7-2	10:00	TG&B Push Core from TG&B Skiff
	1-2	10:24	TG&B Push Core from TG&B Skiff
	13-2	10:35	TG&B Push Core from TG&B Skiff
	25-2	11:05	TG&B Push Core from TG&B Skiff
POST DREDGE			
12-Aug-00	L6-1	11:00	Bean Petite Ponar from CR Environmental boat
	L6-2	15:13	Bean Petite Ponar from CR Environmental boat
14-Aug-00	L6-3	17:00	Bean Petite Ponar from Bean survey boat
	L7-1	17:00	Bean Petite Ponar from Bean survey boat
	L7-2	17:00	Bean Petite Ponar from Bean survey boat
	L7-3	17:00	Bean Petite Ponar from Bean survey boat
15-Aug-00	L8-1	15:38	Bean Petite Ponar from Bean survey boat
	L8-2	15:44	Bean Petite Ponar from Bean survey boat
	L8-3	15:53	Bean Petite Ponar from Bean survey boat

Table J-2 Summary of Collection Efforts

Date	Sites	Time	Method
POST DREDGE			
17-Aug-00	EPA-4	8:25	TG&B Petite Ponar and Push Core from TG&B Skiff
	C4M	9:30	TG&B Petite Ponar from TG&B Skiff
	C4S	10:02	TG&B Petite Ponar from TG&B Skiff
	C5N	10:15	TG&B Petite Ponar from TG&B Skiff
	C5M	10:25	TG&B Petite Ponar from TG&B Skiff
	C5S	10:35	TG&B Petite Ponar from TG&B Skiff
	EPA-28	11:15	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-16	11:55	TG&B Petite Ponar and Push Core from TG&B Skiff (not analyzed)
	C-EB	13:50	TG&B Push Core from TG&B Skiff
	C4N	13:58	TG&B Petite Ponar from TG&B Skiff
	EPA-21	14:21	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-9	14:45	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA28-2	15:15	TG&B Petite Ponar and Push Core from TG&B Skiff (not analyzed)
	EPA-15	15:55	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-27	16:35	TG&B Petite Ponar and Push Core from TG&B Skiff
18-Aug-00	T1A	8:30	TG&B Petite Ponar from TG&B Skiff
	T1B	8:35	TG&B Petite Ponar from TG&B Skiff
	T1C	8:45	TG&B Petite Ponar from TG&B Skiff
	T1D	8:53	TG&B Petite Ponar from TG&B Skiff
	T1E	8:58	TG&B Petite Ponar from TG&B Skiff
	T1F	9:07	TG&B Petite Ponar from TG&B Skiff
	T2F	9:12	TG&B Petite Ponar from TG&B Skiff
	T2E	9:25	TG&B Petite Ponar from TG&B Skiff
	T2D	9:35	TG&B Petite Ponar from TG&B Skiff
	T2C	9:42	TG&B Petite Ponar from TG&B Skiff
	T2B	9:55	TG&B Petite Ponar from TG&B Skiff
	T2A	10:15	TG&B Petite Ponar and Push Core from TG&B Skiff
	C2M	11:37	TG&B Petite Ponar from TG&B Skiff
	T1F-2	12:06	TG&B Petite Ponar and Push Core from TG&B Skiff
	T1E-2	12:26	TG&B Petite Ponar and Push Core from TG&B Skiff
	T1D-2	12:48	TG&B Petite Ponar and Push Core from TG&B Skiff
	T1C-2	13:15	TG&B Petite Ponar and Push Core from TG&B Skiff
	T1B-2	13:36	TG&B Petite Ponar and Push Core from TG&B Skiff
	T1A-2	13:45	TG&B Petite Ponar and Push Core from TG&B Skiff
	C2N	15:19	TG&B Petite Ponar from TG&B Skiff
	EPA-3	16:00	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2B-2	16:30	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2A-2	16:46	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2C-2	17:02	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2D-2	17:22	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-25	17:35	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2E-2	17:50	TG&B Petite Ponar and Push Core from TG&B Skiff
	T2F-2	18:05	TG&B Petite Ponar and Push Core from TG&B Skiff
21-Aug-00	EPA-8	8:00	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-20	8:24	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-26	8:40	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-14	9:05	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-2	9:24	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-7	9:45	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-19	10:29	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-13	10:50	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-1	11:06	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-16	11:31	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-12	14:04	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-23	14:18	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-10	14:31	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-22	14:55	TG&B Petite Ponar and Push Core from TG&B Skiff
	EPA-31	15:09	TG&B Petite Ponar and Push Core from TG&B Skiff

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**1**	**1**	**1**	**1**	**2**	**2**	**2**
Depth	**0-1'**	**1-2'**	**2-3'**	**3-4'**	**0-1'**	**1-2'**	**2-3'**
Field ID	**P1-01 0-1'**	**P1-01 1-2'**	**P1-01 2-3'**	**P1-01 3-4'**	**P1-02 0-1'**	**P1-02 1-2'**	**P1-02 2-3'**
Lab ID	**20A2372**	**20A2373**	**20A2374**	**20A2375**	**20A2376**	**20A2377**	**20A2378**
Sample Size	**0.886 g**	**0.8 g**	**5.71 g**	**6.98 g**	**1.04 g**	**1.3 g**	**7.9 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**34.2**	**33.3**	**34.2**	**44**	**44.3**	**45.7**	**51.8**
Dilution Factor	**5**	**10.0**	**50**	**1**	**5**	**1**	**1**
Min Reporting Limit	**110**	**120.0**	**0.35**	**0.29**	**96**	**77**	**0.25**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener							
8 - 2,4'-Dichlorobiphenyl	2600	14000 J	2900	20	4700	170	3.9
18 - 2,2',5-Trichlorobiphenyl	5000	32000	5800	46	6800	420	8.6
28 - 2,4,4'-Trichlorobiphenyl	35000 J	52000	27000	57	26000 J	620 U	14
44 - 2,2',3,5'-Tetrachlorobiphenyl	6400	28000	7100	28	5100	390	5.9
52 - 2,2',5,5'-Tetrachlorobiphenyl	12000	40000	14000	34	11000	540	7.2
66 - 2,3',4,4'-Tetrachlorobiphenyl	11000	13000	12000	58	7700	220	5.9
101 - 2,2',4,5,5'-Pentachlorobiphenyl	8400	14000	10000	65	5200	240	7.4
105 - 2,3,3',4,4'-Pentachlorobiphenyl	1300	1400	1400	13	260	14 J	0.43
118 - 2,3',4,4',5-Pentachlorobiphenyl	8700	8800	8700	50	5400	110	5.9
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	870	1100	740 J	10 J	340	16 J	0.30 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	5100	6900	4700	30	2700	86	2.0
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	6800	10000	7500	29	4400	150	4.0
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	710	1000	600	1.6	460	9.1 J	0.18 J
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	1100	1500	940 J	4.9 J	640	16 J	0.42 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	1100	1600	980	4.2	680	16 J	0.46
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	140	190	33 J	1.1 J	78	2.8 J	0.085 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	120 U	210	31 UJ	2.6	96 U	ND	0.25 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	110 U	32 J	7.2 J	1.3	96 U	ND	0.081 J
NOAA 18 Congener total ppm	**110**	**230**	**100**	**0.46**	**81**	**2.4**	**0.067**
Total PCB (as homologue)[1] -ppm units	**270**	**560**	**260**	**1.1**	**200**	**6.0**	**0.17**
Internal Standards							
Dibromo-octafluoro-biphenyl	112	209 &	2818 &	110	136 &	87	87
103 - 2,2',4,5',6-Pentachlorobiphenyl	113	108	1733 &	66	117	95	81
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	96	89	125	74	99	102	79

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**3**	**3**	**3**	**4**	**4**	**4**	**5**	**5**	**5**
Depth	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**
Field ID	**P1-03 0-1'**	**P1-03 1-2'**	**P1-03 2-3'**	**P1-04 0-1'**	**P1-04 1-2'**	**P1-04 2-3'**	**P1-05 0-1'**	**P1-05 1-2'**	**P1-05 2-3'**
Lab ID	**20A2380**	**20A2381**	**20A2382**	**20A2384**	**20A2385**	**20A2386**	**20A2388**	**20A2389RE**	**20A2390**
Sample Size	**1 g**	**1.3 g**	**6.56 g**	**0.927 g**	**1.2 g**	**7.89 g**	**1.17 g**	**1.28 g**	**8.3 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**40.5**	**43.2**	**42.8**	**35.1**	**44.2**	**50.2**	**51.6**	**53.4**	**50.3**
Dilution Factor	**20**	**1**	**1**	**50**	**1**	**1**	**5**	**1**	**1**
Min Reporting Limit	**100**	**77**	**0.3**	**110**	**83**	**0.25**	**85**	**7.8**	**0.24**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener									
8 - 2,4'-Dichlorobiphenyl	31000	200	8.6	100000	290	3.2	4600	13	2.7
18 - 2,2',5-Trichlorobiphenyl	47000	390	22	160000	620	8.3	10000	28	8.6
28 - 2,4,4'-Trichlorobiphenyl	110000 J	510 U	34	330000 J	1100	13	23000 J	36 U	10
44 - 2,2',3,5'-Tetrachlorobiphenyl	31000	350	11	110000	770	5.8	4600	64	4.7
52 - 2,2',5,5'-Tetrachlorobiphenyl	62000	660	19	140000	1000	6.1	15000	38 U	4.9
66 - 2,3',4,4'-Tetrachlorobiphenyl	12000	280	11	72000	1500	3.8	7100	14	4.4
101 - 2,2',4,5,5'-Pentachlorobiphenyl	7500	150	8.4	67000	1200	4.1	5300	9.7 U	4.7
105 - 2,3,3',4,4'-Pentachlorobiphenyl	630	9.6 J	0.56	2500	93	0.25	350	ND	0.18 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	6800	140	6.4	32000	1100	1.7	5600	7.8 U	2.7
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	730	16 J	1.0 J	1700	72 J	0.42 J	350	2.1 J	0.13 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	4800	85	3.6	10000	460	0.96	2700	4.0	1.1
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	6800	140	6.5	32000	740	1.9	4500	8.3 U	2.5
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	870	9.1 J	0.70	1800	53 J	0.088 J	440	11 J	0.060 J
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	1300	16 J	1.4 J	2700	91 J	0.33 J	660	4.1 J	0.22 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	1200	16 J	1.4	2300	66 J	0.26	690	7.0 J	0.33
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	150	ND	1.8 J	290	6.3 J	0.087 J	85	24 J	0.098 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	140 UJ	4.0 J	3.3	290 UJ	7.8 J	0.25 U	96 UJ	62	0.24 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	160	ND	1.9	110 UJ	ND	0.094 J	85 UJ	20	0.086 J
NOAA 18 Congener total ppm	**320**	**2.5**	**0.14**	**1100**	**9.2**	**0.050**	**85**	**0.25**	**0.047**
Total PCB (as homologue)[1] -ppm units	**810**	**6.2**	**0.36**	**2700**	**23**	**0.13**	**210**	**0.63**	**0.12**
Internal Standards									
Dibromo-octafluoro-biphenyl	236 &	74	92	392 &	84	85	142 &	71	87
103 - 2,2',4,5',6-Pentachlorobiphenyl	119	84	75	111	93	78	121	81	77
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	95	84	76	91	91	79	97	80	79

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**6**	**6**	**7**	**7**	**8**	**8**	**8**	**8**
Depth	**0-1'**	**1-2'**	**0-1'**	**1-2'**	**0-1'**	**1-2'**	**2-3'**	**3-4'**
Field ID	**P1-06 0-1'**	**P1-06 1-2'**	**P1-07 0-1'**	**P1-07 1-2'**	**P1-08 0-1'**	**P1-08 1-2'**	**P1-08 2-3'**	**P1-08 3-4'**
Lab ID	**20A2392**	**20A2393RE**	**20A2396**	**20A2397RE**	**20A2399**	**20A2400**	**20A2401**	**20A2402**
Sample Size	**2.14 g**	**1.96 g**	**1.5 g**	**1.34 g**	**0.957 g**	**1.06 g**	**7.27 g**	**8.02 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**74.5**	**78.3**	**52.5**	**50.4**	**44.5**	**41.4**	**47.7**	**52.2**
Dilution Factor	**1**	**1**	**1**	**1**	**5**	**10**	**1000**	**1**
Min Reporting Limit	**47**	**1**	**67**	**1.5**	**100**	**94**	**0.28**	**0.25**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	190	ND	1800	ND	5700	22000	3300	39
18 - 2,2',5-Trichlorobiphenyl	460	0.54 J	2900	3.2	7800	35000	5700	37
28 - 2,4,4'-Trichlorobiphenyl	1100 J	1.0 U	8600 J	2.2 U	33000 J	40000	5200	12
44 - 2,2',3,5'-Tetrachlorobiphenyl	180	ND	3000	ND	6500	8600	780	1.9
52 - 2,2',5,5'-Tetrachlorobiphenyl	910	1.2 U	4600	3.4 U	20000	36000	6900	8.9
66 - 2,3',4,4'-Tetrachlorobiphenyl	460	0.35 J	4600	1.5	8400	25000	1600	3.4
101 - 2,2',4,5,5'-Pentachlorobiphenyl	290	1.0 U	3700	1.5 U	5000	6800	560	1.4
105 - 2,3,3',4,4'-Pentachlorobiphenyl	40 J	ND	200	ND	260	180	15	0.25 U
118 - 2,3',4,4',5-Pentachlorobiphenyl	320	1.0 U	3600	1.5 U	5200	7800	520	0.96
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	34 J	ND	210	0.16 J	300	150	7.6	ND
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	200	ND	1600	ND	2700	2800	210 J	ND
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	290	ND	2600	1.5 U	4700	7200	1000	1.3
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	26 J	NDU	260	NDUJ	470	570	45	1.0
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	48	ND	400	ND	700	970	56 J	0.12 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	47 U	ND	360	ND	780	1500	160 J	0.33
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	32 J	ND	37 J	ND	79 J	190	19	ND
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	95 U	0.44 J	67 U	0.22 J	100 UJ	240	28	0.25 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	47 U	0.18 J	67 U	ND	100 UJ	46 J	8.1	0.028 J
NOAA 18 Congener total ppm	**4.6**	**0.0015**	**38**	**0.0051**	**100**	**200**	**26**	**0.11**
Total PCB (as homologue)[1] -ppm units	**11**	**0.0038**	**96**	**0.013**	**250**	**490**	**65**	**0.27**
Internal Standards								
Dibromo-octafluoro-biphenyl	78	95	106	77	142 &	183 &	109	97
103 - 2,2',4,5',6-Pentachlorobiphenyl	87	102	108	87	116	117	1639 &	3440 &
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	86	106	90	88	94	87	121	109

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**9**	**9**	**10**	**10**	**10**	**11**	**11**	**11**
Depth	**0-1'**	**1-2'**	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**
Field ID	**P1-09 0-1'**	**P1-09 1-2'**	**P1-10 0-1'**	**P1-10 1-2'**	**P1-10 2-3'**	**P1-11 0-1'**	**P1-11 1-2'**	**P1-11 2-3'**
Lab ID	**20A2403**	**20A2404**	**20A2407**	**20A2408**	**20A2409**	**20A2411**	**20A2412RE**	**20A2413**
Sample Size	**0.835 g**	**1.26 g**	**0.967 g**	**1.37 g**	**6.58 g**	**2.22 g**	**1.41 g**	**10.3 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**34.1**	**46.8**	**36.5**	**46.4**	**43.2**	**74.4**	**61.4**	**64.8**
Dilution Factor	**50**	**1**	**50**	**1**	**1**	**1**	**1**	**1**
Min Reporting Limit	**120**	**79**	**100**	**73**	**0.3**	**45**	**1.4**	**0.19**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	100000	ND	89000	410	2.1	650	ND	0.28
18 - 2,2',5-Trichlorobiphenyl	150000	110	140000	800	5.1	1200	1.4	0.12 J
28 - 2,4,4'-Trichlorobiphenyl	340000 J	300 U	180000	1300	9.1	3100 J	8.5	0.19 U
44 - 2,2',3,5'-Tetrachlorobiphenyl	100000	130	110000	910	4.3	550	ND	ND
52 - 2,2',5,5'-Tetrachlorobiphenyl	140000	160 U	140000	1300	4.6	2100	2.9	0.12 J
66 - 2,3',4,4'-Tetrachlorobiphenyl	73000	180	81000	1600	4.4	1000	ND	0.097 J
101 - 2,2',4,5,5'-Pentachlorobiphenyl	64000	160	81000	1400	4.1	710	3.9	0.19 U
105 - 2,3,3',4,4'-Pentachlorobiphenyl	2200	8.8 J	2700	110	0.48	94	2.4	ND
118 - 2,3',4,4',5-Pentachlorobiphenyl	12000	140	33000	1300	2.9	760	2.4	0.10 J
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	1600	12 J	1600	80 J	0.39 J	83	2.9 J	0.067 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	9400	79 U	9800	520	1.4	470	1.4 U	0.030 J
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	13000	100	51000	850	2.2	690	4.2	0.090 J
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	1700	6.2 J	1800	60 J	0.10 J	74	ND	ND
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	2500	11 J	2800	100 J	0.32 J	120	ND	0.049 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	2200	7.7 J	2400	92	0.50	100	1.1 J	0.19 U
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	270	2.3 J	300	10 J	0.16 J	14 J	ND	0.081 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	280 UJ	2.7 J	310 UJ	14 J	0.31 U	45 U	2.8	0.19 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	120 UJ	ND	100 UJ	3.2 J	0.054 J	45 U	0.90 J	ND
NOAA 18 Congener total ppm	**1000**	**0.87**	**930**	**11**	**0.042**	**12**	**0.033**	**0.0010**
Total PCB (as homologue)[1] -ppm units	**2500**	**2.2**	**2300**	**27**	**0.11**	**29**	**0.084**	**0.0026**
Internal Standards								
Dibromo-octafluoro-biphenyl	352 &	94	436 &	94	83	98	63	87
103 - 2,2',4,5',6-Pentachlorobiphenyl	106	103	123	103	74	97	66	75
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	95	109	97	97	79	94	59	84

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	12	12	13	13	13	13	14	14
Depth	0-1'	1-2'	0-1'	1-2'	2-3'	3+	0-1'	1-2'
Field ID	P1-12 0-1'	P1-12 1-2'	P1-13 0-1'	P1-13 1-2'	P1-13 2-3'	P1-13 3+	P1-14 0-1'	P1-14 1-2'
Lab ID	20A2415	20A2416RE	20A2418	20A2419	20A2420	20A2421	20A2422	20A2423RE
Sample Size	2.29 g	1.81 g	0.865 g	0.686 g	7.4 g	8.33 g	1.3 g	0.998 g
Weight Basis	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Percent Solids	79.7	80.4	33.8	31.6	47.6	53.7	46	47.5
Dilution Factor	1	1	10	10	20	1	10	1
Min Reporting Limit	44	1.1	120	140	0.27	0.24	77	2
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	52	ND	2800	17000	2400	4.7	6500	16
18 - 2,2',5-Trichlorobiphenyl	200	2.1	5600	46000	3600	13	20000	25
28 - 2,4,4'-Trichlorobiphenyl	780 J	7.1	43000 J	63000	10000	23	40000 J	62
44 - 2,2',3,5'-Tetrachlorobiphenyl	270	ND	6900	39000	3800	8.8	5600	91
52 - 2,2',5,5'-Tetrachlorobiphenyl	600	4.1	45000	53000	5900	11	34000	47
66 - 2,3',4,4'-Tetrachlorobiphenyl	440	2.4	11000	24000	9800	10	7800	24
101 - 2,2',4,5,5'-Pentachlorobiphenyl	320	4.1	9700	38000	8700	10	3200	16
105 - 2,3,3',4,4'-Pentachlorobiphenyl	39 J	0.30 J	1400	3500	860	1.4	190	1.3 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	300	1.2	8100	16000	8800	7.4	3300	14
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	27 J	0.31 J	890	1700	570 J	1.2 J	240	0.90 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	180	1.1 U	5100	9800	3600	3.9	2600	6.8 U
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	260	0.76 J	6600	13000	5700	5.5	4300	12
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	22 J	ND	710	1500	540	0.30	440	ND
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	35 J	0.35 J	1100	2200	800 J	0.66 J	640	1.4 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	44 U	0.56 J	1000	2000	670	0.82	890	1.4 J
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	3.9 J	ND	140	230 J	29 J	0.14 J	86	ND
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	44 U	3.6	130 U	230	29 J	0.31 U	96 UJ	2.3
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	44 U	1.1 U	120 UJ	140 U	9.8 J	0.31	77 UJ	2.0 U
NOAA 18 Congener total ppm	3.5	0.027	150	330	66	0.10	130	0.31
Total PCB (as homologue)[1] -ppm units	8.8	0.067	370	830	160	0.26	320	0.79
Internal Standards								
Dibromo-octafluoro-biphenyl	80	58	121	160 &	706 &	100	169 &	57
103 - 2,2',4,5',6-Pentachlorobiphenyl	89	68	124	90	1064 &	77	130 &	68
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	90	68	101	66	61	82	107	67

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	15	15	15	16	16	16	17	17	17
Depth	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**
Field ID	**P1-15 0-1'**	**P1-15 1-2'**	**P1-15 2-3'**	**P1-16 0-1'**	**P1-16 1-2'**	**P1-16 2-3'**	**P1-17 0-1'**	**P1-17 1-2'**	**P1-17 2-3'**
Lab ID	**20A2426**	**20A2427RE**	**20A2428**	**20A2429**	**20A2430**	**20A2431**	**20A2433**	**20A2434**	**20A2435**
Sample Size	**1.06 g**	**1 g**	**8.13 g**	**0.952 g**	**0.918 g**	**6.57 g**	**1.86 g**	**1.06 g**	**8.41 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**42.3**	**42.1**	**51.4**	**33.4**	**39.9**	**41.5**	**64.2**	**50**	**52.9**
Dilution Factor	**20**	**1**	**1**	**50**	**1**	**1**	**20**	**1**	**1**
Min Reporting Limit	**94**	**4**	**0.25**	**100**	**110**	**0.3**	**54**	**94**	**0.24**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener									
8 - 2,4'-Dichlorobiphenyl	39000	96	27	100000	2000	9.9	5900	ND	0.51
18 - 2,2',5-Trichlorobiphenyl	57000	140	18	170000	3500	20	22000	94 U	0.086 J
28 - 2,4,4'-Trichlorobiphenyl	120000 J	160	8.9	190000 J	5000	44	53000 J	180 U	0.30 U
44 - 2,2',3,5'-Tetrachlorobiphenyl	11000	170	1.9	120000	3500	16	14000	490	ND
52 - 2,2',5,5'-Tetrachlorobiphenyl	63000	180	2.9	150000	5000	19	36000	1200	0.13 J
66 - 2,3',4,4'-Tetrachlorobiphenyl	12000	130	1.4	84000	4700	16	20000	1800	0.18 J
101 - 2,2',4,5,5'-Pentachlorobiphenyl	6700	100	1.1	76000	4400	13	14000	2100	0.34
105 - 2,3,3',4,4'-Pentachlorobiphenyl	610	3.6 J	0.18 J	3600	300	2.0	300	220	0.16 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	6400	100	0.87	37000	3600	9.9	6400	2200	0.20 J
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	620	3.2 J	0.20 J	1900	220 J	0.91 J	410	140 J	0.25 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	4300	32	0.30	10000	1700	5.0	3500	920 U	0.076 J
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	6400	75	0.74	49000 D	2600	7.0	5800	1200	0.21 J
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	780	ND	0.025 J	1800	230	0.57	630	90 J	ND
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	1200	7.7	0.10 J	2900	370	1.1 J	960	130	0.063 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	1200	7.8	0.25 U	2500	320	0.85	1000	96	0.24 U
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	230	1.8 J	0.086 J	310	29 J	0.13 J	120	15 J	ND
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	400 UJ	4.7	0.25 U	310 UJ	110 U	0.30 U	130 UJ	94 U	0.24 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	120 UJ	1.1 J	0.047 J	100 UJ	110 U	0.034 J	54 UJ	94 U	0.052 J
NOAA 18 Congener total ppm	**330**	**1.2**	**0.064**	**1000**	**37**	**0.17**	**180**	**10**	**0.0023**
Total PCB (as homologue)[1] -ppm units	**830**	**3.0**	**0.16**	**2500**	**94**	**0.41**	**450**	**24**	**0.0056**
Internal Standards									
Dibromo-octafluoro-biphenyl	242 &	62	92	437 &	72	89	194 &	61	93
103 - 2,2',4,5',6-Pentachlorobiphenyl	130 &	71	73	115	77	78	140 &	68	77
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	102	66	76	94	63	81	104	59	82

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**18**	**18**	**19**	**19**	**20**	**20**
Depth	**0-1'**	**1-2'**	**0-1'**	**1-2'**	**0-1'**	**1-2'**
Field ID	**P1-18 0-1'**	**P1-18 1-2'**	**P1-19 0-1'**	**P1-19 1-2'**	**P1-20 0-1'**	**P1-20 1-2'**
Lab ID	**20A2437**	**20A2438RE**	**20A2441**	**20A2442RE**	**20A2444**	**20A2445RE**
Sample Size	**1.91 g**	**1.7 g**	**1.06 g**	**0.978 g**	**1.04 g**	**1.18 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**74**	**76.1**	**44.2**	**47.5**	**42.6**	**50.2**
Dilution Factor	**1**	**1**	**20**	**1**	**5**	**1**
Min Reporting Limit	**52**	**1.2**	**94**	**2**	**96**	**1.7**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener						
8 - 2,4'-Dichlorobiphenyl	ND	ND	31000	84	4800	ND
18 - 2,2',5-Trichlorobiphenyl	62	3.7	48000	150	6500	3.5
28 - 2,4,4'-Trichlorobiphenyl	180 J	12	110000 J	200	26000 J	17
44 - 2,2',3,5'-Tetrachlorobiphenyl	73	43	28000	170	4200	ND
52 - 2,2',5,5'-Tetrachlorobiphenyl	140	5.1	67000	220	8900	5.3
66 - 2,3',4,4'-Tetrachlorobiphenyl	93 U	3.8	36000	96	4400	2.0
101 - 2,2',4,5,5'-Pentachlorobiphenyl	73	3.3	27000	64	3100	2.8
105 - 2,3,3',4,4'-Pentachlorobiphenyl	11 J	0.28 J	560	6.0	270	0.17 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	66 UJ	2.0	11000	54	2600	1.1 J
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	7.7 J	0.26 J	810	5.0 J	280	ND
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	40 J	1.2 U	6400	36	1700	1.7 U
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	57	1.5	10000	50	2400	1.0 J
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	4.4 J	ND	1200	4.8	270	ND
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	52 U	0.27 J	1800	8.3	430	0.29 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	52 U	0.18 J	1700	7.8	420	0.25 J
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	1.4 J	ND	180	1.2 J	44 J	ND
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	52 U	0.91 J	200 UJ	2.2	96 UJ	2.7
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	ND	1.2 U	94 UJ	2.0 U	96 UJ	0.52 J
NOAA 18 Congener total ppm	**0.65**	**0.076**	**380**	**1.2**	**66**	**0.037**
Total PCB (as homologue)[1] -ppm units	**1.6**	**0.19**	**950**	**2.9**	**170**	**0.092**
Internal Standards						
Dibromo-octafluoro-biphenyl	85	51	217 &	64	135 &	66
103 - 2,2',4,5',6-Pentachlorobiphenyl	96	64	130 &	74	110	72
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	103	63	96	74	96	67

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	21	21	21	21	22	22	22	22
Depth	0-1'	1-2'	2-3'	3+	0-1'	1-2'	2-3'	3+
Field ID	P1-21 0-1'	P1-21 1-2'	P1-21 2-3'	P1-21 3+	P1-22 0-1'	P1-22 1-2'	P1-22 2-3'	P1-22 3+
Lab ID	20A2447	20A2448	20A2449	20A2450	20A2451	20A2452	20A2453	20A2454
Sample Size	0.844 g	0.971 g	6.31 g	7.06 g	0.823 g	1.03 g	7.91 g	7.16 g
Weight Basis	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Percent Solids	35.3	41.3	42.4	45.6	34.6	46.2	51.2	45.8
Dilution Factor	20	1	1	1	20	1	50	50
Min Reporting Limit	120	100	0.32	0.28	120	97	0.25	0.28
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	51000	1600	3.5	11	40000	1100	190	170
18 - 2,2',5-Trichlorobiphenyl	76000	2700	3.2	16	69000	1900	320	300
28 - 2,4,4'-Trichlorobiphenyl	100000	4000	4.0	23 J	86000	3100	1000	980
44 - 2,2',3,5'-Tetrachlorobiphenyl	56000	2500	2.5	12	54000	2100	280	270
52 - 2,2',5,5'-Tetrachlorobiphenyl	75000	3800	4.2	16 J	69000	3100	320	300
66 - 2,3',4,4'-Tetrachlorobiphenyl	62000	3000	4.8	13	33000	3600	200	220
101 - 2,2',4,5,5'-Pentachlorobiphenyl	37000	2400	3.8	10	34000	3300	210	190
105 - 2,3,3',4,4'-Pentachlorobiphenyl	2800	150	0.21 J	0.92	2500	340	48	54
118 - 2,3',4,4',5-Pentachlorobiphenyl	24000	2100	2.8	6.9	9500	2900	110	120
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	1600	120 J	ND	1.1	1600	210 J	20	20
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	9300	940 U	ND	5.6	8600	1400	96	90
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	13000	1500	2.4	7.4	12000	2000	120	100
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	1700	120	ND	2.3	1600	180	18	16
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	2500	190	0.36	1.1	2300	280	26	23
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	2000	170	0.32	1.0	2100	220	19	17
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	250	15 J	ND	0.15 J	280	24 J	2.4	2.2
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	290	100 U	0.32 U	0.28 U	350	97 U	2.3 U	2.1 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	44 J	100 U	0.038 J	0.044 J	86 J	97 U	0.44	0.45
NOAA 18 Congener total ppm	510	24	0.032	0.13	430	26	3.0	2.9
Total PCB (as homologue)[1] -ppm units	1300	61	0.080	0.32	1100	64	7.4	7.2
Internal Standards								
Dibromo-octafluoro-biphenyl	322 &	70	82	91	334 &	69	248 &	218 &
103 - 2,2',4,5',6-Pentachlorobiphenyl	108	78	5268 &	3590 &	116	79	91	90
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	88	67	98	100	94	69	69	70

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	23	23	23	24	24	25	25	25
Depth	0-1'	1-2'	2-3'	0-1'	1-2'	0-1'	1-2'	2-3'
Field ID	P1-23 0-1'	P1-23 1-2'	P1-23 2-3'	P1-24 0-1'	P1-24 1-2'	P1-25 0-1'	P1-25 1-2'	P1-25 2-3'
Lab ID	20A2455	20A2456RE	20A2457	20A2459	20A2460RE	20A2462	20A2463	20A2464
Sample Size	1.76 g	1.51 g	10.8 g	1.91 g	1.75 g	0.828 g	0.894 g	8.42 g
Weight Basis	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Percent Solids	74.5	66.6	70.1	79.6	80.9	36.5	38.7	55.1
Dilution Factor	1	1	1	1	1	10	5	5
Min Reporting Limit	57	1.3	0.18	52	1.1	120	110	0.24
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	140	ND	0.25	30 J	ND	8600	12000	28
18 - 2,2',5-Trichlorobiphenyl	310	1.5	ND	130	1.2	18000	15000	48
28 - 2,4,4'-Trichlorobiphenyl	440 U	11	0.27 U	310 U	6.8	36000	34000	120
44 - 2,2',3,5'-Tetrachlorobiphenyl	160	ND	ND	180	ND	12000	14000	39
52 - 2,2',5,5'-Tetrachlorobiphenyl	630	6.7	0.16 J	380	1.4	28000	17000	51
66 - 2,3',4,4'-Tetrachlorobiphenyl	310	3.8	0.12 J	300	ND	29000	32000	64
101 - 2,2',4,5,5'-Pentachlorobiphenyl	210	5.1	0.19	210	2.1	17000	14000	36
105 - 2,3,3',4,4'-Pentachlorobiphenyl	28 J	1.9	0.066 J	30 J	ND	2300	2000	7.2
118 - 2,3',4,4',5-Pentachlorobiphenyl	230	2.4	0.10 J	210	ND	12000	13000	35
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	26 J	ND	0.072 J	20 J	ND	1200	870 J	3.6 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	130	ND	0.075 J	110	1.1 U	6600	5500	18
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	200	3.4	0.13 J	150	ND	8500	7500	22
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	15 J	ND	ND	13 J	ND	930	790	2.8
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	26 J	ND	ND	19 J	0.15 J	1500	1200	3.8 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	24 J	0.92 J	0.18 U	15 J	ND	1300	1000	3.3
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	7.3 J	ND	0.036 J	2.0 J	ND	170	120 J	0.49 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	14 J	1.8	0.18 U	3.2 J	1.2	190	120 U	0.87 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	8.1 J	2.5	0.020 J	ND	1.1 U	37 J	110 U	0.17 J
NOAA 18 Congener total ppm	2.5	0.041	0.0012	1.8	0.013	180	170	0.48
Total PCB (as homologue)[1] -ppm units	6.2	0.10	0.0030	4.5	0.032	460	420	1.2
Internal Standards								
Dibromo-octafluoro-biphenyl	87	68	87	84	61	141 &	97	94
103 - 2,2',4,5',6-Pentachlorobiphenyl	90	73	72	95	70	113	89	75
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	96	70	82	99	68	104	71	80

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	**26**	**26**	**26**	**27**	**27**	**27**
Depth	**0-1'**	**1-2'**	**2-3'**	**0-1'**	**1-2'**	**2-3'**
Field ID	**P1-26 0-1'**	**P1-26 1-2'**	**P1-26 2-3'**	**P1-27 0-1'**	**P1-27 1-2'**	**P1-27 2-3'**
Lab ID	**20A2465**	**20A2466RE**	**20A2467**	**20A2469**	**20A2470RE**	**20A2471**
Sample Size	**1.04 g**	**1.13 g**	**7.46 g**	**1.08 g**	**0.998 g**	**7.22 g**
Weight Basis	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**	**DRY**
Percent Solids	**45.4**	**46.4**	**47.8**	**45.8**	**42.1**	**47**
Dilution Factor	**10**	**1**	**1**	**10**	**1**	**1**
Min Reporting Limit	**96**	**1.8**	**0.27**	**92**	**2**	**0.28**
Units	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**	**ug/Kg**
PCB Congener						
8 - 2,4'-Dichlorobiphenyl	11000	140	15	21000	28	2.0
18 - 2,2',5-Trichlorobiphenyl	23000	220	22	31000	49	3.9
28 - 2,4,4'-Trichlorobiphenyl	27000	670	39	37000	58	5.4
44 - 2,2',3,5'-Tetrachlorobiphenyl	6300	140	8.4	15000	84	2.6
52 - 2,2',5,5'-Tetrachlorobiphenyl	37000	280	24	37000	49	3.4
66 - 2,3',4,4'-Tetrachlorobiphenyl	9200	98	9.0	21000	21	2.1
101 - 2,2',4,5,5'-Pentachlorobiphenyl	3300	39	4.1	6500	12	1.1
105 - 2,3,3',4,4'-Pentachlorobiphenyl	190	2.6	0.30	550	1.2 J	0.18 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	4000	40	2.8	7200	10	0.87
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	290	3.5 J	0.31 J	530	0.99 J	0.14 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	3000	31	2.3	4100	5.0 U	0.48
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	5100	51	4.0	6600	7.8	0.87
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	560	5.5	0.28	720	ND	0.023 J
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	800	8.6	0.64 J	1100	1.0 J	0.16 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	1000	8.7	0.63	1200	0.98 J	0.28 U
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	100	1.6 J	0.19 J	120	0.91 J	0.098 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	120	2.5	0.27 U	140	2.8	0.28 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	24 J	0.50 J	0.12 J	39 J	2.0 U	0.080 J
NOAA 18 Congener total ppm	**130**	**1.7**	**0.13**	**190**	**0.33**	**0.023**
Total PCB (as homologue)[1] -ppm units	**330**	**4.4**	**0.33**	**480**	**0.82**	**0.059**
Internal Standards						
Dibromo-octafluoro-biphenyl	184 &	60	86	251 &	58	88
103 - 2,2',4,5',6-Pentachlorobiphenyl	112	70	74	113	66	78
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	85	66	81	88	73	81

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-3 Pre-Dredge Sediment Core PCB Data.

Location	28	28	28	29	29	29	30	30
Depth	0-1'	1-2'	2-3'	0-1'	1-2'	2-3'	0-1'	1-2'
Field ID	P1-28 0-1'	P1-28 1-2'	P1-28 2-3'	P1-29 0-1'	P1-29 1-2'	P1-29 2-3'	P1-30 0-1'	P1-30 1-2'
Lab ID	20A2473	20A2474	20A2475	20A2477	20A2478RE	20A2479	20A2481	20A2482RE
Sample Size	0.866 g	1.02 g	7.1 g	1.78 g	1.51 g	8.25 g	2.06 g	1.6 g
Weight Basis	DRY	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Percent Solids	34.8	44.5	45.5	71.7	72.9	52.6	78.5	79.8
Dilution Factor	20	10	1	1	1	1	1	1
Min Reporting Limit	120	98	0.28	56	2.6	0.24	48	1.2
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener								
8 - 2,4'-Dichlorobiphenyl	34000	9100	1.7	2400	ND	1.0	64	ND
18 - 2,2',5-Trichlorobiphenyl	60000	22000	4.9	3800	2.6 U	ND	180	1.8
28 - 2,4,4'-Trichlorobiphenyl	95000	26000	5.8	3900	ND	2.8	360 U	7.7
44 - 2,2',3,5'-Tetrachlorobiphenyl	49000	12000	3.1	2200	ND	2.5	170	ND
52 - 2,2',5,5'-Tetrachlorobiphenyl	65000	22000	2.7	6000	63	10	490	3.8
66 - 2,3',4,4'-Tetrachlorobiphenyl	37000	7600	1.6	2300	10	1.6	310	ND
101 - 2,2',4,5,5'-Pentachlorobiphenyl	34000	8100	1.8	1300	16	8.6	240	2.0
105 - 2,3,3',4,4'-Pentachlorobiphenyl	2600	700	0.14 J	140	4.6	2.5	34 J	ND
118 - 2,3',4,4',5-Pentachlorobiphenyl	12000	3100	0.80	1200	13	2.1	230	ND
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	1600	420 J	0.13 J	160 J	3.1 J	3.3 J	39 J	ND
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	9000	2700	0.58	1100	12 U	1.3	140	1.2 U
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	12000	4100	0.98	1500	14	2.8	200	ND
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	1500	620	0.039 J	170 J	ND	ND	15 J	ND
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	2300	680	0.26 J	270 J	11	1.9 J	37 J	ND
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	1900	720	0.28 U	290	15	2.4	18 J	ND
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	240	69 J	0.096 J	31 J	26 J	4.6 J	5.6 J	0.22 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	260	98 U	0.28 U	36 J	68	8.3	24 J	1.2 U
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	49 J	98 U	0.078 J	6.0 J	22	5.4	16 J	ND
NOAA 18 Congener total ppm	**420**	**120**	**0.025**	**27**	**0.27**	**0.061**	**2.2**	**0.017**
Total PCB (as homologue)[1] -ppm units	**1000**	**300**	**0.062**	**67**	**0.66**	**0.15**	**5.5**	**0.042**
Internal Standards								
Dibromo-octafluoro-biphenyl	288 &	59	88	106	63	102	67	65
103 - 2,2',4,5',6-Pentachlorobiphenyl	102	81	75	93	68	80	77	74
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	87	75	80	72	74	68	75	84

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data
All results are surrogate corrected

Table J-5 Post Dredge Cut 1 Transect - Sediment Grab PCB Data.

Location	T1A	T1B	T1C	T1D	T1E	T1F	T2A
Depth	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm
Field ID	NBPDT1A-2	NBPDT1B-2	NBPDT1C-2	NBPDT1D-2	NBPDT1E-2	NBPDT1F-2	NBPD-T2A-2
Lab ID	20A3232RE	20A3233RE	20A3234RE	20A3235RE	20A3236RE	20A3237RE	20A3210RE
Sample Size	0.888 g	0.951 g	0.958 g	1.03 g	0.998 g	0.867 g	0.723 g
Weight Basis	DRY	DRY	DRY	DRY	DRY	DRY	DRY
Percent Solids	42.3	38.5	45.4	45	48.2	40.7	31.3
Dilution Factor	1	1	1	1	1	1	1
Min Reporting Limit	2200	4200	420	390	400	920	11000
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener							
8 - 2,4'-Dichlorobiphenyl	3400	4600	520	1100 J	1400	8400	4300 J
18 - 2,2',5-Trichlorobiphenyl	6700	9100 J	1000 J	2200 J	2900 J	14000 J	12000 J
28 - 2,4,4'-Trichlorobiphenyl	11000 J	16000 J	1800 J	3800 J	5000 J	23000 J	32000 J
44 - 2,2',3,5'-Tetrachlorobiphenyl	5200	7200	840	1700 J	2500	10000 J	13000
52 - 2,2',5,5'-Tetrachlorobiphenyl	8600	12000	1400	3000 J	4600	19000	25000
66 - 2,3',4,4'-Tetrachlorobiphenyl	6100	8500	1000	2300 J	3200	11000	22000
101 - 2,2',4,5,5'-Pentachlorobiphenyl	5100	7100	780	1800 J	2400	7900	19000
105 - 2,3,3',4,4'-Pentachlorobiphenyl	560 J	650 J	74 J	230 J	400 U	920 U	2000 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	3500	4800	560	1400 J	1600	5000	14000
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	330 J	530 J	47 J	120 J	100 J	400 J	1100 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	2100 J	2800 J	320 J	820 J	950 U	3200 U	7700 J
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	3200	4400	490	1200 J	1600	5600	12000
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	300 J	410 J	43 J	120 J	140 J	270 J	1000 J
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	450 J	700 J	67 J	180 J	140 J	610 J	1500 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	430 J	580 J	66 J	170 J	180 J	700 J	1500 J
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	42 J	62 J	6.2 J	19 J	17 J	59 J	150 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	66 J	210 J	7.8 J	21 J	15 J	78 J	140 J
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	26 J	150 J	1.3 J	3.4 J	400 U	18 J	11000 U
NOAA 18 Congener Total ppm	57	80	9.0	20	26	110	170
Total PCB (as homologue)[1] -ppm units	140	200	23	50	64	270	420
Internal Standards							
Dibromo-octafluoro-biphenyl	99	115	98	135 &	69	80	111
103 - 2,2',4,5',6-Pentachlorobiphenyl	110	124	114	127 &	89	110	119
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	97	111	95	111	71	74	105

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data

All results are surrogate corrected

Table J-5 Post Dredge Cut 1 Transect - Sediment Grab PCB Data.

Location	T2B	T2C	T2D	T2E	T2F
Depth	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm	Grab 0-2cm
Field ID	NBPD-T2B-2	NBPDT2C	NBPDT2D	NBPDT2E	NBPD-T2F-2
Lab ID	20A3211RE	20A3221RE	20A3224RE	20A3223RE	20A3212RE
Sample Size	1.15 g	1.17 g	1.24 g	1.14 g	1.2 g
Weight Basis	DRY	DRY	DRY	DRY	DRY
Percent Solids	48.4	47.1	52.4	50.7	46.4
Dilution Factor	1	1	1	1	1
Min Reporting Limit	1700	340	130	140	330
Units	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
PCB Congener					
8 - 2,4'-Dichlorobiphenyl	2400	2500 J	170	410	1000 J
18 - 2,2',5-Trichlorobiphenyl	4700 J	4500 J	390	840	2000 J
28 - 2,4,4'-Trichlorobiphenyl	8900 J	8000 J	490 J	1300 J	3100 J
44 - 2,2',3,5'-Tetrachlorobiphenyl	4000	3500 J	240	650	1500 J
52 - 2,2',5,5'-Tetrachlorobiphenyl	7100	6200 J	430	1000	2600 J
66 - 2,3',4,4'-Tetrachlorobiphenyl	5100	4700 J	270	870	1700 J
101 - 2,2',4,5,5'-Pentachlorobiphenyl	4200	3700 J	240	630	1400 J
105 - 2,3,3',4,4'-Pentachlorobiphenyl	450 J	430 J	18 J	87 J	160 J
118 - 2,3',4,4',5-Pentachlorobiphenyl	3100	2900 J	160	490	1000 J
128 - 2,2',3,3',4,4'-Hexachlorobiphenyl	300 J	280 J	14 J	42 J	98 J
138 - 2,2',3,4,4',5'-Hexachlorobiphenyl	1800	1800 J	98 J	270	620 J
153 - 2,2',4,4',5,5'-Hexachlorobiphenyl	2800	2500 J	160	400	920 J
170 - 2,2',3,3',4,4',5-Heptachlorobiphenyl	270 J	280 J	14 J	38 J	87 J
180 - 2,2',3,4,4',5,5'-Heptachlorobiphenyl	400 J	410 J	20 J	54 J	140 J
187 - 2,2',3,4',5,5',6-Heptachlorobiphenyl	390 J	400 J	20 J	53 J	130 J
195 - 2,2',3,3',4,4',5,6-Octachlorobiphenyl	45 J	45 J	1.8 J	5.0 J	14 J
206 - 2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	65 J	50 J	3.1 J	6.6 J	17 J
209 - 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	25 J	14 J	0.86 J	1.6 J	4.1 J
NOAA 18 Congener Total ppm	46	42	2.7	7.1	16
Total PCB (as homologue)[1] -ppm units	120	110	6.8	18	41
Internal Standards					
Dibromo-octafluoro-biphenyl	97	215 &	81	85	146 &
103 - 2,2',4,5',6-Pentachlorobiphenyl	110	154 &	93	99	122
198 - 2,2',3,3',4,5,5',6-Octachlorobiphenyl	98	104	87	88	96

[1]Calculated using Foster Wheeler's (January, 2001) regression equation: Total PCBs as homologues = NOAA 18 Congener sum (ppm) * 2.5

Qualifiers and Notes
U = congener is not detected above the MDL
J = value is estimated
& = QC criteria failure

Total PCB summations do not include U-qualified data

All results are surrogate corrected

Table J-6
Summary of PCB Concentrations in Sediments

	Pre-Dredge Cores				Post Dredge				
Station	Sediment Depth				Core	Grab	T1	T2	Station
	0-1 ft	1-2 ft	2-3 ft	3-4 ft	0-1 ft	0-2 cm	0-5 CM	0-5 cm	
1	270	560	260	1.1	28	130	140	420	A
2	200	6.0	0.17		14	0.47	200	120	B
3	810	6.2	0.36		10	110	23	110	C
4	2700	23	0.13		7.9	240	50	6.8	D
5	210	0.63	0.12				64	18	E
6	11	0.0038					270	41	F
7	96	0.013			16	160			
8	250	490	65	0.27	3.8	280			
9	2500	2.2			0.67	37			
10	2300	27	0.11			280			
11	29	0.084	0.0026						
12	8.8	0.067				50			
13	370	830	160	0.26	56	160			
14	320	0.79			8.5	260			
15	830	3.0	0.16		8.6	260			
16	2500	94	0.41		17	310			
17	460	24	0.0056						
18	1.6	0.19							
19	950	2.9			19	140			
20	170	0.092			36	98			
21	1300	61	0.080	0.32	130	230			
22	1100	64	7.4	7.2		250			
23	6.2	0.10	0.0030			160			
24	4.5	0.032							
25	460	420	1.2		65	29			
26	330	4.4	0.33		7.7	50			
27	480	0.82	0.059		82	450			
28	1000	300	0.062		13	470			
29	67	0.66	0.15						
30	5.5	0.042							
31						470			

Note: All concentrations reported as total PCB (as homologue) in ppm

Table J-7. Calculation of Average PCB Concentration in Sediments

	Pre-Dredge			Post-Dredge
	0 – 1 foot	1 – 2 feet	2 – 3 feet	0 – 1 foot
Entire Horizon	654	91	15	
Dredging boundaries	857	147	26	29

Notes:

1) All concentrations reported as total PCB (as homologues) in ppm
2) PCB concentrations (ppm) within each 1 foot depth horizon in the pre-design study area based on an inverse-distance weighting interpolation procedure. Values are shown for each complete horizon (100 feet x 400 feet), as well as within the dredging boundaries (100 feet x 240 feet) for each horizon (used in mass PCB removal calculations).

Table J-8. Calculation of PCB Mass Removal Efficiency

Depth Horizon	Sediment Mass (Kg)	Average PCB Concentration (ppm)	Mass of PCBs (Kg)
Pre-dredge: 0-1 foot	1495022	857	1281
Pre-dredge: 1-2 feet	1495022	147	220
Pre-dredge: 2-3 feet	1495022	26	38
Pre-dredge: Sum	4485066		1539
Post-dredge: 0-1 foot	1495022	29	44
PCB Mass Removal Efficiency = 97%			

Notes:

1) All concentrations reported as total PCB (as homologues) in ppm.
2) Removal efficiency was calculated as the percent of PCB mass remaining post-dredge compared to the mass of PCBs before dredging.

Formulas & Constants:

Volume = L x W x H
Cubic feet / 27 = cubic yards
Cubic yards x 0.7645 = cubic meters
1 cubic meter of sediment = 2200 Kg
Mass of PCBs (Kg) = Kg-sed x ug/g PCB x 1e-6g/ug

Table J-9. Calculation of the Thickness of Contaminated Surficial Sediment that would result in a 10ppm Concentration in the 0-1' Composite Sample.

Equation 1: Number of grams of sediment in 1ft^3

Cubic ft	Cubic yds	Cubic m	Kg	grams
1.00	0.037037	0.028148	61.926	61925.93

Equation 2: Mass of PCB's needed to contaminate 1ft^3 of clean sediment to a concentration of 10ppm.

[PCB] ppm	[PCB] ug/g	1 cu.ft (grams)	ug PCB present
10	10	61926	619259

Calculations: The estimated depth of contaminated surficial sediments (cs) needed to contaminate 1ft^3 of clean sediments to a concentration of 10ppm, listed by degree of overlying contamination.

Assumed Surficial Sediment Concentration		Mass PCB in 1 cubic foot sample with 10 ppm average concentration (ug)	Mass of Surficial Sediment with given PCB concentration		Associated Volume of Surficial Sediment with Given PCB Concentration		Thickness of Surficial Sediment Layer with Given PCB Concentration (inches)
[PCB] ppm	[PCB] ug/g (cs)		g	Kg	cubic m (cs)	cubic in (cs)	
4000	4000	619259	154.815	0.155	0.00007	4.3	0.03
1000	1000	619259	619.259	0.619	0.00028	17.3	0.12
500	500	619259	1238.518	1.239	0.00056	34.6	0.24
100	100	619259	6192.590	6.193	0.00281	172.8	1.20
50	50	619259	12385.180	12.385	0.00563	345.6	2.40

Calculation explaination:
1: Calculations were preformed to determine the depth of contaminated surficial sediments needed to contaminate 1 cubic foot of clean sediments to a concentration of 10ppm. This was determined by first finding the number of grams in 1 cubic foot of sediment. It was assumed that 1 cubic meter of sediment is equal to 2200kg. This information was then used to convert cubic feet to grams of sediment. The result of this calculation is shown in Equation 1, as 61926g.

2: The mass of PCB's needed to contaminate 1ft3 of clean sediment to a concentration of 10ppm was determined as shown in equation 2. This was determined by multiplying the mass of 1ft3 of clean sediment by 10ppm of PCB's.

3: The final calculations were determined as shown in the Calculations box. The assumed surficial sediment concentration is multiplied by the mass of PCBs in 1ft3 of sediment wit a 10ppm average concentration to give the mass of surficial sediment with given PCB concentration. The mass of sediment is then converted to sediment volume using a standard assumption. The volume is then converted into a depth using a box of 12 inches in length and width.

Formulas, Constants and Assumptions
1 cubic meter of sediment = 2200 Kg
Volume = L x W x H
Cubic inches/1728 = cubic feet
Cubic feet / 27 = cubic yards
Cubic yards x 0.7645 = cubic meters
Mass of PCBs (kg) = Kg-sed x ug/g PCB x 1e-6g/ug

Click here to go to Appendix K